ORBITOFACIAL ANTHROPOMETRIC ASSESSMENT OF INNER-INTERCANTHAL AND OUTER- INTERCANTHAL DISTANCE IN KANYAKUMARI POPULATION - AN IN VIVO STUDY

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In Partial fulfillment of the requirement for the degree of

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BRANCH III

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CERTIFICATE

This is to certify that the dissertation entitled, **"ORBITOFACIAL ANTHROPOMETRIC ASSESSMENT OF INNER-INTERCANTHAL AND OUTER-INTERCANTHAL DISTANCE IN KANYAKUMARI POPULATION - AN IN VIVO STUDY"** is a bonafide research work done by Dr. T. HARINEE, Post graduate student during the period of 2015-2018 under my guidance and supervision. This dissertation is submitted to the Tamil Nadu Dr. M.G.R. Medical University, Chennai in partial fulfilment of the requirements for the award of Master of Dental Surgery, Branch III Oral and Maxillofacial Surgery. It has not been submitted (partially or fully) for the award of any other degree or diploma.

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CERTIFICATE II

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DECLARATION

I hereby declare that this dissertation, "**Orbitofacial Anthropometric Assessment of Inner-Intercanthal and Outer-Intercanthal Distance in Kanyakumari Population - an Invivo Study"** is a bonafide record of work undertaken by me and that this thesis or a part of it has not been presented earlier for the award of degree, diploma, fellowship, or similar title of recognition.

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LIST OF ABBREVIATIONS

IICD	-	Inner InterCanthal Distance
OICD	-	Outer InterCanthal Distance
Mm	-	Millimetre
Cm	-	Centimetre
OPD	-	Out patient department
NOE	-	Naso-orbito-ethmoidal
CLAP	-	Cleft lip and palate

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Abstract

BACKGROUND

Orbitofacial anthropometrics have become an important tool used in reconstructive surgery and by genetic counsellor. Canthus is the term which is used to describe the either corner of eyes. Inner canthus is also called as medial or nasal canthus. Outer canthus is also called as lateral or temporal canthus. Post-traumatic and congenital deformities can be treated with the knowledge of normal value. Normal canthal values can serve as a guide for the diagnosis of pathology and interventions for craniofacial abnormalities. Thus, it is necessary to have local data of these parameters since this standard reflects the potentially different pattern of craniofacial growth resulting from racial, ethnic, sexual and dietary differences. Hence this study is under taken to find out the normative inner inter-canthal and outer-intercanthal distance measurement, in population residing in kanyakumari region.

AIMS AND OBJECTIVES:

- To find out the normal inner and outer canthal distance and the changes with aging and difference of value between the gender in kanyakumari population.
- Evaluating the normal inner and outer canthal distance.
- Finding the difference in inner canthal and outer canthal distance among age groups and between gender.

MATERIALS AND METHODS:

Group I:240 individuals between the age of 7 – 40 years from Kanyakumari District.

RESULTS:

In this study it was found out that the mean inner-intercanthal distance is 32.75 ±2.54 mm and outer-intercanthal distance is (100.88 ± 58.80) mm in kanyakumari population. There is no significant difference between the values when compared between the ages. The inner-intercanthal distance in females (31.94± 1.89 mm)is higher than males (30.45 ± 2.19),even though the values are not significant. The outer-intercanthal distance in females (100.94±2.45mm) is higher than males(99.23 ±1.45mm).

CONCLUSION:

The observation from this study suggest that the mean inner-intercanthal distance in females is found to be 32.75 ±2.54mm and in males is100.88±58.80mm. There is difference in inner-intercanthal and outer-intercanthal distance between the gender. Also there is gradual increase in the values with age.

KEYWORDS:

Inner-intercanthal distance, outer-intercanthal distance, orbitofacial anthropometry.

Introduction

Anthropometry is the study of measurement of different parts of the body to find out their proportions[1] . The Greek sculptor Polycleitus in the fifth centaury B.C described the ideal proportions of the human body[2]. Medical craniofacial anthropometry methods are different from those of classical physical anthropology, in such a way that there are increased number of craniofacial landmarks and measurements. Also there are more ways used to make some measurements, and in the interpretation of the findings. There are different ways to take measurements in medical anthropology. These comprise of direct anthropometry (in which measurements are taken directly from the subject) and three indirect anthropometric methods: photogrammetry, soft-tissue[3]. In the past several decades of the late 19th century the science of anthropometry has been introduced into clinical practice[4].Orbitofacial anthropometrics have become an important tool used in reconstructive surgery and by genetic counselor. During embryogenesis the distance between the orbits varies and after birth it changes according to the general craniofacial development[5].

The bilateral orbital region of the upper face determines the attractiveness, youthfulness and health of an individual[6]. Canthus is the term which is used to describe the either corner of eyes. Inner canthus is also called as medial or nasal canthus. Outer canthus is also called as lateral or temporal canthus[7].According to the general craniofacial development the normal distance between orbits differs during embryogenesis and after development.

An increased distance between the orbits (more than two standard deviations from the normal values) is described as hypertelorism[8]. Telecanthus may be present without or with widely spaced eyes. In the latter case, widely spaced eyes should be

coded separately. IICD distance varies among different ethnic groups. Norms are available for American Africans [Murphy and Laskin, 1990], Chinese [Wu et al., 2000], and Caucasians [Laestadius et al., 1969; Feingold and Bossert, 1974; Merlob et al., 1984; Evereklioglu et al., 2001][9]. IICD values would be higher in these conditions.

False hypertelorism or pseudohypertelorism due to soft tissue abnormality could be prevented by measuring the inner and outer intercanthal distances in diagnosing craniofacial abnormalities[10] Also, these datas would be useful for studying the syndromic characteristics and serve as a baseline for reconstructive surgeries[8]. In addition, reconstruction of the canthus following deformities of the orbit, congenital or acquired, measurement of the canthal distances to achieve anatomic restitution[11].

Injuiries to the naso-orbito-ethmoid fracture results in traumatic telecanthus. Telecanthus occurs in frontobasal or naso-orbito-ethmoidal (NOE) trauma, because the base of the nose may be wedged between the orbits or the nasal skeleton[12]. Disruption of the medial canthal ligament results in traumatic telecanthus. Intercanthal distances greater than 35 mm are suggestive of a displaced NOE fracture, while those greater than 40 mm are diagnostic feature of such a fracture[13]. Inadequate or delayed correction of traumatic telcanthus can result in scarring and secondary deformities [12] Post - traumatic and congenital deformities can be treated with the knowledge of normal value[14].

Normal canthal values serves as a guide for the diagnosis of pathology and interventions for craniofacial abnormalities. Thus, it is necessary to have local data

of these parameters since this standard reflects the potentially different pattern of craniofacial growth resulting from racial, ethnic, sexual and dietary differences[9]. Adequate positioning of medial canthal complex is the keystone for successful reconstruction, which will help in maintaining the normal inter canthal distance. For these reasons standards based on the ethnic and racial data are required. These standards reflect the potentially different patterns of craniofacial growth resulting from ethnic, racial, and sexual differences[11].

Statistical data about the anthropometric measurements in a population are useful for forensic scientist.[15] Furthermore, these values are useful in the manufacture of spectacle frames and lenses.[16]

In deformity, the patient's measurement has to be compared with the normal values which are specific for patient's race, age and sex. In the literature, there are certain studies which indicate that the morphology and anatomical relationship of palpebral fissure varies according to age, sex and ethnicity. In the surgical point of view, even though the number of advanced corrective and surgical procedures has been developed in the field of reconstructive surgery, the lack of knowledge of the variations in the morphological and anatomical relationship of periorbital structures among different ethnic groups may hamper the surgeon's efforts to retain the ethnical features. Therefore, the knowledge of anatomic relations, morphology, coupled with aesthetical criteria of the patient population is a crucial part of treatment planning to achieve ideal postoperative outcomes, particularly in bilateral conditions. Since the normal data base of one ethnic group may not represent the others, there is a requirement for ethnically specific database.[17]

Earlier many researchers have studied craniofacial parameters and come up with standard formulations based on ethnic or racial data. Hence this study is under taken to find out the normative inner-intercanthal and outer-intercanthal distance measurement, in population residing in Kanyakumari district. The relationship between the orbitofacial dimensions with advancing age will be explored. The difference in the inner intercanthal distance and outer intercanthal distance with respect to gender will be found out in the population.

Aims & Objectives

Review of Literature

AIM:

- To find out the normal inner and outer intercanthal distance and the changes with aging and difference of value between the gender in Kanyakumari population.

OBJECTIVES:

- Evaluating the normal inner and outer canthal distance.
- Finding the difference in inner intercanthal and outer intercanthal distance among age groups and gender.

Anthropometry is the study of measurement of different shape and size of the body. Inner intercanthal distance refers to the distance measured between the two inner canthal of the eyes whereas the outer canthal distance is the distance measured between the two lateral canthus of the eye. Orbitofacial anthropometrics have become an important tool used by genetic counselor and in reconstructive surgery. The diagnosis of many dysmorphic syndromes is based on advanced cytogenetic and molecular techniques. Before referring a case for costlier molecular diagnostic tests, recognition of subtle morphological anomalies and corresponding useful diagnostic test should be determined.[18]

Ocular adnexal changes and somatometric traits of the face such as epicanthus, telecanthus and widely spaced eyebrows may create an illusory error in the identification of certain craniofacial syndromes, and reliable methods are needed for the diagnosis of some craniofacial anomalies.[14]

The variability of facial features among different ethnic groups should be borne in mind when the planning for surgeries. These variabilities plays an important role in the treatment planning of patients requiring orthodontic, orthognathic and facial aesthetic/reconstructive procedures .Reliance on normative craniofacial data published for populations from unrelated ethnic groups, or using the neoclassical proportional norms, may be potentially unreliable. Paul Tessier considered as the father of modern craniofacial surgery, emphasized that from a clinical point of view, the most difficult thing to establish for any patient's facial morphology is ‘what is normal’ and ‘what is abnormal’ in that face. As there are a large number of variable parameters, such as age, gender, ethnic background and even cultural desires for what constitutes a ‘normal’ facial appearance, it is

important to assess normal faces for each given population, and in particular, to find normative proportional relationships that may be used to aid clinical practice.[19]

Inner intercanthal distance is one of the important facial parameters which can be used as a tool for medical genetics for diagnosis of syndromes . Also it can be used for the evaluating several systemic syndromes, craniofacial abnormalities, and for surgical correction of traumatic telecanthus.[1]

Traumatic telecanthus is the most common clinical feature associated with NOE fractures. Medial canthal tendon is the pivotal structure in the nasal region which supports the canthus. The paramount in study is to correct the telecanthus, enophthalmos and other clinical symptoms.[20]

Dysmorphic craniofacial features may be apparent in individuals with syndromic conditions such as Apert's,Crouzon's, trisomy 13, Robinson's syndromes, Williams, and the Meckel-Gruber syndromes. Also, the normative measurements of these parameters may also be useful for preliminary identification purposes in settings were robust forensic procedures are in limited supply.[15]

Laestadius and co-workers has reported that 78 percent of the adult ICD is attained by 1 year of age; subsequently the rate of growth in this area reduces in contrast to that of the outer orbital dimension. The intercanthal width reached full maturation at 8 years in females and 11 years in males. In comparison with other skeletal structures, the orbital measurements showed more advanced early development and less subsequent growth than the forehead and bizygomatic widths.[11]

The clinical observation of face especially the orbital region is essential in diagnosis of many phenotypic anomalies. These anomalies can be either quantitative or qualitative. Qualitative anomalies are easy to find out when compared with the normal phenotype. Hypertelorism is one of the quantitative anomalies. It is the increased distance between the eyes. This condition is etiologically and pathogenically heterogeneous. It is not an isolated syndrome by itself . It is an anomaly which acquires as a part of syndrome or malformation sequence. Three possible pathogenic mechanisms lesser wings of the sphenoid, fixing the orbits in fetal position or failure of development of the nasal capsule, allowing the primitive brain vesicle to protrude into the space normally occupied by the capsule resulting in morphokinetic arrest in the position of the eyes; and disturbance in the development of the skull base as in craniosynostosis syndromes or in mid-facial malformations But in diagnosis of quantitative anomalies such as hypertelorism knowledge about the normal values in each ethnic group is required .[21]

Frakas et al in 2005 stated that a variety of craniofacial abnormality, traumatic facial injuries, reconstruction and orthognathic surgery , even orthodonthic treatment produce changes in facial appearance. An understanding of facial aesthetics, craniofacial proportions and age-, gender- and ethnicity-specific craniofacial measurements is thereby beneficial in clinical practice, providing guidance for both clinical diagnosis and treatment planning.[22]

One of the rarest syndrome is Acher's syndrome which is characterized by blepharochalasis, double upper lip and decreased outercanthal distance. Diagnosis of Acher's syndrome is purely clinical. Shivcharan LC reported a case in which the patient had decreased outercanthal distance.[23]

In 1975 Richard C et al measured the distances between the medial canthi, lateral canthi, and the pupils of 580 black boys and 639 black girls, between the age 5 to 11-year-old normal subjects. The intercanthal and interpupillary values for black boys significantly exceed those of white boys. There are three exceptions involving interpupillary distance. The values for black girls exceed those of white girls. There are two exceptions, one each of the lateral canthal and interpuillary distances. The measurements of a patient can be compared with normal standards, which is specific for race as well as age and sex. The values for neither the canthal nor the circumference-inter orbital index of the blacks differed from values available for whites.[24]

Juberg R C et al in 1975 studied the normal values for intercanthal distances of 5- to 11-year-old American blacks. The distance between the medial canthus, the lateral canthus and pupils were measured in 580 black boys and 639 black girls. The values were compared with previously published values and found out the intercanthal distance of black boys and black girls significantly exceeded that of the white boys and white girls.[25]

Singh J.R. et al in 1983 did a studied in which they measured the Interpupillary distance (IP), inner and outer canthal distances (IC, OC) have been investigated in an Indian population to establish normal values for these parameters. In males, the mean values of IC and OC were found to be 3.15 ± 0.2445 and 8.44 ± 0.3172 cm, respectively. However, in females these values were 3.09 ± 0.2862 and 8.17 ± 0.3310 cm, respectively.[26]

In 1990 Murphy WK et al studied 100 black patients (71 female and 29 male). They were measured for intercanthal and interpupillary distance. For the overall group the mean intercanthal distance was 33.9 ± 3.0 mm; previous studies of white persons and mixed populations indicate an average of 32 ± 3 mm. The mean interpupillary distance for this study was 63.7 ± 3.7 mm; previous studies indicate an average of 63 ± 3 mm. This study suggests that the intercanthal and interpupillary distances in blacks are similar to findings of previous studies on whites and mixed populations.[27]

Julie R Quant et al in 1991 measured the exophthalmus, intercanthal distance, interpupillary distance, interorbital distance in 243 adults of age group ranging from 18 to 60 years and concluded that the intercanthal distance value for male is in the range of 31.07 to 40.77mm and in males it is in the range of 30.17 to 40.09mm. He also compared the obtained mean value with the intercanthal values of Koreans, Caucasians, blacks ,Vietnamese and found out that the ICD of HOK is similar to that of blacks but it is larger than Caucasians population.[28]

Kaimbo D K et al in 1994 studied the orbital measurements in Zairian children. The intercanthal distance were measured with ruler. 95 healthy subjects in the age group of 2 ½ to 18 years were included in the study which included 47 boys and 48 girls. The study is performed by dividing into 4 groups. First group included children in the age 21/2 to 6 years , second group in the age of 7 to 10 years, third group in the age group of 11to 14, and fourth group in the age group of 15 to 18 years. The mean intercanthal distance was 27.4 +/- 2.7 mm for the first age group, 29.7+/- 3.1 mm for the second age group, 30 +/- 2.4 mm for the third age group and 32.2 +/- 3.1 mm for the fourth age group. The mean +/- SD outer orbital was 100.0

+/- 4.4 mm for the first age group, 106.5 +/- 4.6 mm for the second age group, 111.7 +/- 6.8 mm for the third age group and 118.5 +/- 6.4 mm for the fourth age group.[29]

Roberto L barrette et al Orbital measurements in black and white population in 1999 .the study included1126 patients which included white men (n = 34) black men (n = 33),white women (n = 31), and black women (n = 28). He found out that intercanthal distances differed between male and female. But there is no significant difference in the ICD between black and white population.[30]

Wu KH et al in 2000 studied the inner canthal distance, outer canthal distance, interpupillary distance, and palpebral fissure length. 4446 normal Chinese children in Taiwan were included in the study. The sample of 284 full term neonates, 2742 infants and children aged from 1 month to 3 years, and 1420 preschool children were measured for inner canthal distance, outer canthal distance, interpupillary distance and palpebral fissure length. No significant sex differences were observed. Compared with previous studies, inner canthal distance, outer canthal distance and interpupillary distance in Chinese children in Taiwan were wider than those in Caucasian children. They also found that inner canthal distance was wider than palpebral fissure length at the same age; therefore it was not correct to diagnose hypertelorism in Chinese children in Taiwan; as if an imaginary third eye could fit between the eyes. Thus, they suggest that measurements should be adjusted with normal standards specific for race. Consideration of the position of eyes is relevant for the diagnosis of a large number of syndromes.[31]

Kaimbo k et al in the year 2000 did study to find out the changes in the innercanthal distance in children affected with sickle cell anemia. The measurements

were done in 66 Congolese children with homogenous sickle cell anemia in the age group of 2 to 18 years old. The obtained results were compared with 95 healthy children in the similar age. The innercanthal distance were similar to healthy children whereas the outercanthal distance were smaller than the healthy children[32].

Kitaoka T et al in 2001 studied the inter-inner canthal distance ,inter-outer canthal distance and inter –pupilary distance in 1600 normal infants and children. There is significant increase in the DIC, DOC and PD from one month after birth to 12 years of age. PD is increased from 13 years to 15 years of age. DIC and DOC were stable. The DIC/PD and DOC/DIC averages were 0.61 and 2.73, respectively, one month after birth and 0.63 and 2.69 at three months after birth. On the other hand, DIC/PD and DOC/DIC were stable at 0.55-0.59 and 2.45 from 8 to 15 years of age. DIC and DOC were stable but PD increased from 13 years of age to 15 years of age in junior high school[34]

Gupta et al in 2003 did a study in the Indian population to establish the normal values for intercanthal and outercanthal distance in the age group of 3-80 years. 2500 participants were enrolled in the study. The intercanthal, outercanthal distance for males were in the range of 20-36 mm and 76-105 mm and in female the values were in the range of 20-36 mm and 71-105 mm respectively. The difference in the mean values in some groups were statistically significant. When compare with other population the normal values in the Indian population is lower than the other population.[35]

Fok TF et al in 2003 studied the inter-canthal distance and outer-canthal distance in new born Chinese babies. He enrolled 2384 babies in the gestation period

of 33 and 42 weeks. The male Hong Kong infants had significantly larger inter-canthal and outer-canthal distance than their female counterparts. Further they concluded that the results were compared with the Caucasians and it ICD is smaller in Hong Kong infants while the OCD is higher. Further they stated that there exists no difference when compared with the Taiwan population. these intra-racial differences are due to the operation of geographic, environmental or cultural factors remain to be explored. Inter-racially, most studies did not report any significant differences between sexes [36]

Saheeb BDO et al in 2004 studied the medial and lateral canthal distances in 3 to 18 years 468 male and 408 female Nigerians and concluded that the mean value of medial canthal distance for the Nigerians is slightly higher than the Caucasians. No significant difference in the lateral canthal distance between the group. There is significant difference in medial canthal distance between the Nigerian and Caucasian females. But there is no significant difference in the lateral canthal distance.[37]

Erika N et al in 2005 did Measurements in 77 individuals (39 males and 38 females). Craniofacial measurements (total 38) were compared between males and females, and between Latvians and non-Latvians. Comparing measurements from the orbital region we found that supraorbital depth, orbital depth, intercanthal width, binocular width, eye fissure length, and interpupillary distance were larger in males, but orbital depth was similar in males and females. there is no statistically significant differences in almost all craniofacial measurements if compared between Latvian and non-Latvian females. As expected, sexual dimorphism was found to be statistically significant in almost all parameters that include head and face.[38]

Egwu OA et al in the year 2008 published the normal inner canthal and outer canthal distance in Nigerian population. A total of 460 students including 264 males and 196 females. The mean age of 23.27±3.48 years for males and 21.37±2.82 years for females volunteered in this study. The mean IICD for males and females were 43.90±4.11 mm and 41.77±3.37 mm respectively. The mean OICD was found to be 118.34±0.66 for males and 114.76±0.34 for females. The canthal index (CI) showed 37.10±2.93 for males and 36.41±2.69 for females. Persons correlation coefficient indicated positive relationship between IICD, OICD, CI, FOD and Body surface area (BSA). IICD and OICD correlated with height while OICD alone correlated with Body mass index (BMI). A multiple regression equation was developed for CI as dependent variable and FOD, Age and height as independent variables. This study will provide a databank for craniofacial surgeons and ophthalmologists and help in the evaluation of deformities, post-traumatic telecanthus and hypertelorism in our population.[39]

Mohammad Etezad-Razavi et al in 2008 studied the correlation between the interpupillary and inter–outercanthal distance. The study included 254 female and 165 males between 3 months to 20 years. Participants were divided into 4 groups The mean for intercanthal distance is 29.16±3.31 for males and female 29.2±3.4. The mean for outer-canthal distance for females is 78.86±7.7 and males 80.45±9.22. There is significant difference in the values of OICD in the age group of 3-5 years.[40]

Oladipo et al in 2010 carried out a study to determine the normal mean values of interpupillary distance, nasal limbus to temporal limbus, inner-outer intercanthal distance, inner intercanthal distance outer intercanthal distance, length of palpebral fissure and canthal index of Ijaw adults distance, length of palpebral

fissure and canthal index of I jaw adults. He concluded that Nigerian males and females had mean Inner intercanthal distance of 3.89cm and 3.7 cm, mean outer Intercanthal distance of 10.77cm and 10.46cm respectively. The results obtained indicate a sexual dimorphism with a significantly higher values of all the parameters in males compared to females ($p<0.05$) using Z-test. They also concluded that the results of this study will be of immense use in forensic medicine and anthropology and will also serve as a future frame work for estimating the ocular dimension of Nigerians.[17]

In 2010 Amira AAA et al, did a study to evaluate the hypertelorism in genetic syndromes and to start setting up the standards for orbital parameters among children in Egypt. Head circumference, outer canthal inner canthal and interpupillary distances were measured in 279 children; 49 patients with syndromes involving hypertelorism and 230 normal control children within the same age group. 13 groups were included in the control group and mean values of the orbital measurements were estimated for all the thirteen groups. Normal values were obtained and compared with the children with hypertelorism and with other population. No significant differences were found between the sex in different orbital measurements such as intercanthal and outercanthal distance. Also the Eygyptian orbital parameters did not match the Africans and Americans, but it coincided with that of the Turkish. They also concluded that the craniofacial syndromes had greatest measurements of hypertelorism. This study can acquaint the geneticists on the need to the actual measurement, in relation to age, sex and racial standards for accurate diagnosis of syndromes.[20]

Blessing N R Jaja et al in 2011 studied the intercanthal and outer canthal distance in 16-18 years females and males. The resultant mean inner canthal distance was 1.85±0.30cm and 2.07±0.29cm (males vs. females, p=0.000); mean outer canthal distance, 10.39±0.56cm and 10.40±0.98cm (males vs. female, p= 0.899). The resultant mean values were lower than the other Nigerian groups.[15]

Umweni et al in the year 2011 studied the medial canthal distance (MCD) and lateral canthal distance(LCD) in 43 cleft lip and palate patients(CLAP) ,which included 27 males and 16 females. MCD for males CLAP patients 39.3 mm While 31.9 mm for normal population while mean female MCD was 39.3 mm compared with 31.6 mm for normal population. The mean, LCD for CLAP males was 110.8 mm while a normal population male was 105.2 mm . Mean LCD for females CLAP was 110.5 mm compared with 104.8 mm for normal sample. Mean MCD and LCD for both males and females were significantly higher in CLAP patients than normal population ($p<0.01$).[41]

Patil SB et al in 2011 studied the eyelid measurements in 160 patients between the age group of 16-60 years in Indian population. He divided the patients into three groups Groups A to C: 16 to 30 years, 31 to 45 years, 46 to 60 years, respectively. A significant increase in palpebral fissure from Group B to Group C was observed. As age progressed beyond 45 years increase in intercanthal distance was observed. There was a significant decrease in the interpupillary distance as age increased-from Group A to Group B .The anatomy of the Indian population is distinct in that the palpebral fissure in men is less than that in women. It appears that changes in the eye become more pronounced after 45 years, including an increase in

palpebral fissure, intercanthal distance, and height of the upper lid, along with a decrease in interpupillary distance.[42]

Amal A. Bukhari et al in 2011 Measurements were made on 668 subjects (mean age 33.8 years; 58.7% female). The horizontal palpebral aperture was 30.1 ± 2.9 mm (mean ± SD), vertical palpebral aperture was 10.1 ± 0.85 mm, upper lid skin fold height was 3.6 ± 1.9 3 mm, upper lid crease height was 9.6 ± 0.8 mm, eyebrow height was 10.2 ± 2.7 mm, and intercanthal distance was 32 ± 2.7 mm. There was a statistically significant correlation between gender and eyebrow height (P = 0.001) and gender and horizontal palpebral aperture (P = 0.016), but no significant correlations were noted between any measurement and age. Conclusions: Saudi Arabian eyes are unique in exhibiting a higher upper lid skin fold, higher lid crease.[43]

Osunwoke E.A et al in 2012 conducted a study the normal intercanthal and outercanthal, interpupillary distance and head circumference on 3-21 years old Ijaws. Total of thousand people were included in the study. Vernier caliper, non stretchable plastic ruler and tape were included in the study. The results showed that the intercanthal distance, outercanthal distance for male is 28.30+-4.16 mm,92.49+-6.30 mm respectively and for females is 28.15+-2.75 and 91.96+-5.81 mm respectively. This study found that the overall intercanthal for males is larger than the females[18]

Vasanthakumar P et al in 2012 studied the palpebral fissure width (PFW), palpebral fissure height (PFH), palpebral fissure inclination (PFI), outercanthal distance (OCD),interpupillary distance (IPD), intercanthal distance (ICD) in the

south Indian adults with the age group of 18-26 years males and females and concluded that there is no sexual dimorphism in the intercanthal distance (male: 34.27 mm; female: 33.41 mm) while outercanthal distance showed sexual dimorphism (male: 95.55 mm; female: 92.44 mm). According to Caucasians norms, the ICD ranges from 30 to 35 mm. In the present study, mean value of ICD in both genders (male: 34.27 mm; female: 33.41 mm) follows the Caucasians norms. In our study, no significant gender difference was observed in mean ICD. Farkas et al. reported a mean value of 34.1 mm in Indian males and Kunjur at al.1 reported 33.3 mm in White females. Our findings of ICD in both the sexes (male: 34.27 mm; female:33.41 mm) were similar to the figures reported by Farkas et al. and Kunjur et al. When compared to our study, Farkas et al. reported lower mean values of 27.3 mm for males and 24.6 mm for female subjects aged 18-30 in a study on an Iranian population. Oldipo et al.13 reported higher values (male: 38.9 mm; female: 37.3 mm) compared to our study. He further stated that the ethnicity and gender should be considered in the orbital surgeries by the surgeons. The results from this study construe that there is a statistically significant gender difference in certain parameters between males and females. When the data of the present study were compared with the previous reports, the measured parameters showed variations and similarities (racial and sexual) with other populations. Variations in the morphology of orbital features according to race, sex and ethnicity may affect the treatment planning and diagnosis during facial analysis. Hence, during reconstructive surgery, it is important for the surgeons to have knowledge of local norms during facial analysis in order to evaluate and modify the disproportionate features without disturbing the ethnical features. The results of this study will be of immense use in

surgical procedures like ocular prosthetics, blepharoplasty and in forensic science to trace missing individuals by applying facial reconstruction techniques, dentistry, genetics and pale anthropological studies.[6]

Esomonu UG et al in 2012 did a study to document the intercanthal and outer canthal distance in 2700 subjects which included 1350 males and 1350 females. The subjects were divide into age groups of 7-9, 10-12, 13-15, 16-18, 19-21, 22-24, 25-27, 28-30 and 31-40 years. The inner canthal distance lengthened by 6.2 mm in males and 41 mm in females for subjects between 7-9 and 13-15 years old age groups and the outer canthal distance increased by 9.2 mm in males and in females 9.5 mm. The inner canthal distance gradually lengthened further by 6 mm in males for ages between 16-18 and 22-25 years old groups and in females it gradually shortened by 10 mm whereas the outer canthal distance value shortened by 3 mm in the male .In female the value further lengthened slightly by 13 mm. In group of 25-27 and 31-40 years old, in females the inner canthal distance gradually shortened by 7 mm while in males its values did not change . The outer canthal distance value in the male is shortened by 3.8 mm while female value remained the same. They concluded that aging affects the growth rate of the canthal distances. Higher growth rate noted in the 7 to 15 years old subjects.[44]

Agarwal J in 2013 conducted a study on the assessment of inter-canthal and outer-canthal distance in Chhattisgarh region and found all the measured parameters were increasing between 7 to 25 years and the maximum growth in ICD and OCD is found in between 8 and 9 year in both sexes. They obtained values as follows. In male, the mean values of ICD and OCD observed among children (age 7-14 years) were 30.53mm and 92.57 mm respectively; in young adults (age >14 to 25 years)

were 31.82 mm and 95.69mm respectively; and in adults (age >25 to 40 years) were 32.50mm and 96.10mm respectively. In female, the mean values of ICD and OCD observed among children (age 7-14 years) were 30.44mm and 91.89 mm respectively; in young adults (age >14 to 25 years) were 31.70 mm and 94.16mm respectively; and in adults (age >25 to 40 years) were 32.00mm and 94.40mm respectively. All parameters were higher in males than in females , but the difference was not statistically significant. In conclusion, they stated that this present study documents the anthropometric variation pattern of the orbitofacial parameters of population residing at Chhattisgarh region and presents normative data for the measured parameters, specific for age and sex. This data may be used as an important tool for diagnosis of many dysmorphic syndrome by genetic counsellor, in reconstructive surgery and for identifying dead or live person by forensic expert.[7]

Yaese S N Jayartane et al in 2013 studied the periocular norms in 103 subjects which includes 51 males and 52 females , between 18 and 35 years and he concluded that that the inner canthal distance for males is 40.61 mm and females is 38.27 mm and binocular width is 93 mm for males and 88.39 mm for females. He finally concluded that there is no significant sexual dimorphism between the gender. Measurement of periocular structures is of great value in several clinical specialties including optometry, ophthalmology, medical and clinical genetics, oculoplastic surgery, and traumatology. Periocular abnormalities can also arise through trauma. Traumatic telecanthus, which is often observed in naso-orbito-ethmoid complex fractures. It is important to note that several interacting features such as epicanthic

folds, flat nasal bridges, widely spaced eyebrows, or narrow palpebral fissures can give rise to the visual impression of hypertelorism.[45]

Kalpit Shah et al in 2014 studied the inner intercanthal and outer intercanthal distance in 3500 subjects from birth to 70 years of age and concluded that all these values are stabilized by 16-20 years of age. IICD and OICD started increase only after one month .the OICD shoed faster growth in the first two years of life while IICD the growth is steady in the first decade of life. The value obtained by him are IICD in the range of 19.82-34.14, for OICD it was 57.31-87.97 mm. They finally concluded that this study gives a nomogram for these parameters in the average Indians which could be relied upon in diagnosis of craniofacial syndromes and orbito-facial trauma or for planning reconstructive surgeries for the same, in making of accurate spectacles & for manufacture of binoculars & stereomicroscopes. The difference between the two sexes is present but is not statistically significant in our population group.[17]

Anibor E et al in 2014 studied the intercanthal and outercantal distance in the age group of 12-35 years in the Isokos male and females . Results showed that Isoko males and females had mean OCD of 106.17±3.73 and 107.13±2.98 respectively and mean ICD of 36.98±1.96 and 34.63±2.24 respectively. The mean OCD and ICD of Isoko males are higher than OCD and ICD of Isoko females.He also conclude that the result also showed that the CI of Isoko males increased as age increases when compared with the values of Isoko females. It is believed that genetics and environmental factors may be responsible for the variation in CI and other craniofacial indices between and within the populations.[46]

Muhja s et al in the year 2014 established the normative craniofacial dimensions and proportional relationships for Sudanese female (SF) population, North American White population(NAW) and Africane America female (AA)Population. He compared the normative values for each population with one another .He concluded that there is no significant difference in intercanthal width between the three populations. when the Sudanese intercanthal measurement was compared to the Africane American sample, and a P-value of 0.25 when the same measurement in the Sudanese sample was compared to the North American White sample. They concluded by using these normative anthropometric data which includes both linear and proportional values the diagnosis and treatment planning of young adult female patients of Sudanese descent can be made more accurately.[47]

Kumar AKV et al conducted a study in 2014 to correlate the ICD and combined mesiodistal width of maxillary anterior teeth. In this study the mean ICD was measured and correlated with the combined width of the maxillary anterior teeth. The mean ICD in all subject was found to be 30.23±1.51mm. ICD was chosen for measurement in the present study for the following reasons: Studies have proved that the reference points (namely, medial angles of the palpebral fissures of the eyes) as a stable anthropometric parameter. These reference points can be easily located and measured with a simple instrument such as vernier calliper[48].

Usman YM and Shugaba AI in 2015 stated that the Canthal indices in the Ibibios are clearly different from other populations. The study among the Igbos revealed that ageing affects the rate of growth of the intercanthal distances. For the healthy urban Turkish subjects, there was significant increase in near and distant IPD measurements with age until 19 years in male subjects. In the Sudanese

population, ICD was found to be greater in males than in females. No statistically significant difference exists in the inner canthal and interpupillary distances between both Egyptian boys and girls for the same mean age. In Saudi Arabian adults, mean ICD was 31.92mm. It has been demonstrated that genetics, environmental factors, gender and age results in variations of the considered parameters. This has demonstrated that genetics, environmental factors, sex and age are responsible for the variation in the considered parameters. Therefore when making clinical determination of ocular hypo or hypertelorism in some craniofacial malformations and various syndromes, it should not be enough to rely on impression on physical features on the face only but to consider standards. It is therefore recommended that more studies be carried out among the numerous other ethnic groups and races so that national and international standards can be documented.[49]

Shivahare p et al performed a study to in which maxillary intercanine width can be used to detect interpupillary distance, intercanthal distance, interalar distance and bizygomatic distance and to evaluate the role of maxillary intercanine width in the 2D reconstruction of the face. In this study the IICD in age groups of 18–23 24–28 ,29–35 is 32.78±3.21mm, 30.28±3.46mm, 30.84±2.79 in males and females it is 30.17±0.83 mm,31.38±3.12mm, 31.34±2.25 mm it is respectively. The OICD in age groups of 18–23 ,24–28 ,29–35 is 96.11±5.25 94.90±4.55 94.58±3.60and in females is 89.78±2.04mm, 90.34±4.74 mm,91.88±4.22mm. All these values in all age groups in males are higher than the females.[50]

Alkhairy S et al in 2016 studied the orbital measurements. Pakistan population in 500 people which included 227 males and 274 females and concluded

that the mean intercanthal distance is 3.4cm ± 0.4cm and outer canthal distance is 10.7cm ± 3.9cm.There is no mean difference found in the values by gender or age group separately. Also they conclude that the anthropometric variations for head circumference, inner canthal distance, outer canthal distance and the interpupillary distance are seen with age and gender. The standard baseline values should be defined for these parameters . Also these should be considered when classifying a patient with hypertelorism, hypotelorism or telecanthus or when planning an orbital surgery.[3]

Meltem Acar Gudek et al studied the Anthropometric measurements of the orbital contour and canthal distance in young Turkish population. He included 115 students 59 females and 54 males in the study and found out that the male had mean value of intercanthal distance and outercanthal distance of 28.68 ± 3.61 mm, 96.43 ± 11.90 mm respectively. Females had mean value of inner-intercanthal distance and outer canthal distance of 27.84 ± 2.90 mm, 95.08 ± 9.85 mm respectively. Measurements were higher in males than in females. They concluded that these values can be used for clinical interpretation of periocular pathology and serve as reference values when planning aesthetic and posttraumatic surgical interventions.[51]

Dennis E et al in 2012 studied the intercanthal and outercanthal distance head circumference in 601 subjects including 313 males and 288 females. The subjects were in the age group of 18-30 years from the Urhobo ethnic group of Nigeria. The mean value of intercanthal distance in males is 39.7 mm while in females it is 38.5 mm . The mean value for outercanthal distance in males is 106.8

mm while in female is 104.4 mm. And concluded that there is significant difference in the values between the genders.[52]

Pool GM et al conducted a study in 2016 . In this study 204 children with ages ranging from birth to 36 months were included . Soft-tissue and bone windows were reviewed and the intercanthal (IC), bony interorbital (IO), and bony lateral orbital (LO) distances were measured. There was rapid increase in soft-tissue and bony measurements from 0–6 months , after 12 months there is tapering of the values. The mean IC distance 22.22 ± 1.13 mm , bony IC is 14.16 ± 0.74 mm, and bony LO is 65.56 ± 1.76 mm, at 12 months were 27.74 ± 1.01 mm, 16.21 ± 0.75 mm, and 77.98 ± 1.57 mm, respectively. The bony LO position was equivalent to the lateral canthal position and measurements. For all the group the IC distance was one-third the lateral canthal distance. They concluded that this study established and reported normal anthropometric orbital measurements in a paediatric population using fine-cut craniofacial CT. These measurements serves in evaluating children with craniofacial anomalies.[53]

Attokaran G et al did a study and concluded that the inner intercanthal distance and the mesiodistal width of the maxillary anterior increases with age . They concluded that in Thrissur population the inner intercanthal values in females showed statistical significance when compared with width of the maxillary anteriors. They also observed that the inner-intercanthal distance showed dynamic changes as the age increases in both males and females. Also the values are higher in males than in females.[54]

Nzeako et al. In 2017 studied the intercanthal distance and outercanthal distance in people in the delta state , which included 569 males and 431 females in the age of 21-35 years with normal craniofacial configuration. A vernier calliper was used to measure the inner intercanthal distance and outer intercanthal distance. The male (34.06mm) had higher intercanthal distance than the females (33.59) even though the values statistically insignificant. He further compared the this study with other studies by Bruce and Timothy (1992) who reported 34±4mm; Murphy and Lasin (1990) reported as 33.9±3.0 mm; Ngeow and Akan (2005) reported as 33.0±2.6mm; for Malaysians . These values are similar to the value of this study. These significant difference in the values could be due to racial and ethnic differences caused by environmental and genetic factors. These things could control pre-pubertal and post-pubertal development of the upper third of the face. He concluded that the knowledge gained from this study will help in the understanding of orbito-cranial growth patterns of females and males in this subgroup, for early diagnosis of craniofacial syndrome and the surgical management of craniofacial deformities. However, craniofacial dimension should be performed with normal standards specific for age, sex, race and ethnic group. Thus, the data obtained in this study is important to maxillofacial surgeons, clinicians and forensic scientist.[55]

Ting Yin Lu et al in 2017 published a journal in which they studied the prevalence of double eyelid among the Malays and Chinese who reside in Malaysia. They also the measured the periorbital tissue parameters among these two Mongoloid ethnicities . 103 Malay and 97 Chinese volunteers participated in this study. They were captured using indirect 3D photogrammetry. The measurements were obtained using the software provided by the manufacturer. The author found

out that all Malays and 70.1% of Chinese in this cross section population had double eyelid on both eyes. They also found out that the intercanthal distance of the Chinese (IDC = 35.85 mm) was wider and their interpupillary distance was narrower (IPD = 62.85 mm) compared to the Malays' (ICD = 34.21 mm; IPD = 64.04 mm). In conclusion, there were significant differences in the prevalence of double eyelid and periorbital tissue among these two ethnic groups.[56]

Annelyse C B et al in 2017 studied 100 Caucasian volunteers at a tertiary hospital in Southern Brazil. He in this study stated that Craniofacial anthropometry began when anthropologists measured human skulls to categorize and classify the minto races. It was then discovered that the nasal index was the best index for distinguishing the different humanethnicities.1The initial clinical application of craniofacial measurements occurred in cases of congenital alterations and after disfiguring facial traumas, situations in which the surgeon needed to know the standard measures, with the anthropometric studies, based on the general population, serving as an excellent basis.2Since then, the development of facial morphology measures has taken place along with the development of facial plastic surgery, because facial anthropometric measures, considered as facial aesthetics standards, provide objective information for an adequate preoperative evaluation and surgical programming. The ''ideal'' facial measures are present in numerous books and articles about facial plastic surgery. However, there is rarely an attempt to defend its validity with the frontal and lateral view photos, intercanthal distance, alar distance, nasal dorsum length, nasofrontal angle, nasolabial angle, and nasal tip projection were obtained. A statistical analysis was performed to compare the measures obtained between genders and with the ideal patterns. Only 6% of the population

sample had an intercanthal distance equal to the alar distance, other 6% showed a greater intercanthal distance compared to the alar, while the great majority (88%) had a greater alar distance compared to the intercanthal. The alar distance was significantly greater than the intercanthal distance ($p < 0.001$). Comparing the results obtained in the population studied and those presented in the literature, except for the nasolabial angle, the population anthropometric measurements were statistically different and larger than the aesthetic ideal.[57]

Materials & Methods

The present study was carried out in the Department of Oral and Maxillofacial surgery, Sree Mookambika Institute of Dental Sciences, Kulasekharam.

Study period:

Study period is 12 months.

Study design:

This is a Cross sectional study for finding the normative value for inner - intercanthal and outer-intercanthal distance in kanyakumari district.

Study setting:

Individuals attending Sree Mookambika Institute of dental science is randomly selected and explained about the procedure and study is conducted in Oral and Maxillofacial Surgery Department.

Only 240 individuals who fulfilled the inclusion criteria formed the study group.

Study subjects:

Individuals attending Sree Mookambika institute of dental science.

Number of groups to be studied: One.

Group in detail:

240 individuals between the age of 7 – 40 years from Kanyakumari District. This included 120 males and 120 females.

SAMPLING:

Sample size calculation

$$N = \frac{4pq}{d^2}$$

P=Inner canthal distance =30.53

Q=100-P

D=20% of P

Level of confidence=95%

Level of power=80%

Sample size=235.67=240

Total sample size of study =240.

Sampling technique : Systematic random sampling

EXCLUSION CRITERIA:

- Individuals with the history of neurological disease
- Developmental disabilities.
- Oculofacial trauma.
- Craniofacial congenital anomaly.
- Individuals not willing to participate.

INCLUSION CRITERIA:

- Individuals from Kanyakumari district attending Oral and Maxillofacial Department (SMIDS)
- Individuals in age group of 7-40 years.
- Strabismus and clinically manifested telecanthus or epicanthus.

- Individuals with previous history of maxillofacial surgery.
- Individuals not willing to participate in the study.

This study protocol was reviewed then approved by our department review board, research committee, ethical committee and all the individuals participated in the study were informed about the benefits and possible risks.

EQUIPMENT AND ARMAMENTARIUM:

1. Digital vernier calliper.
2. Laptop.

PROCEDURE IN DETAIL:

The individuals fulfilling the inclusion criteria, who are attending Sree Mookambika institute of dental science are randomly selected and explained about the study and taken to oral and maxillofacial surgery. After getting informed consent and if the individuals are less than 18 years old the parents are explained about the procedure and got informed consent from them in the ascent form.

The individual is comfortably seated in the dental chair, in a relaxed upright position with his/her at the same level of examiner's head. In case if the individuals are wearing they are asked to remove it for measurement. The individual is requested to look straight and stay steady. For measuring the inner-intercanthal distance, the vernier caliper was gently placed on the medial canthus of one to the medial canthus of other eye and the distance between the medial canthus of either eye is measured and the reading is noted in the data sheet. Then the reading in the vernier calliper is adjusted to zero before measuring the outer canthus distance. The position of the head of the individual is again checked .Then the vernier calliper is

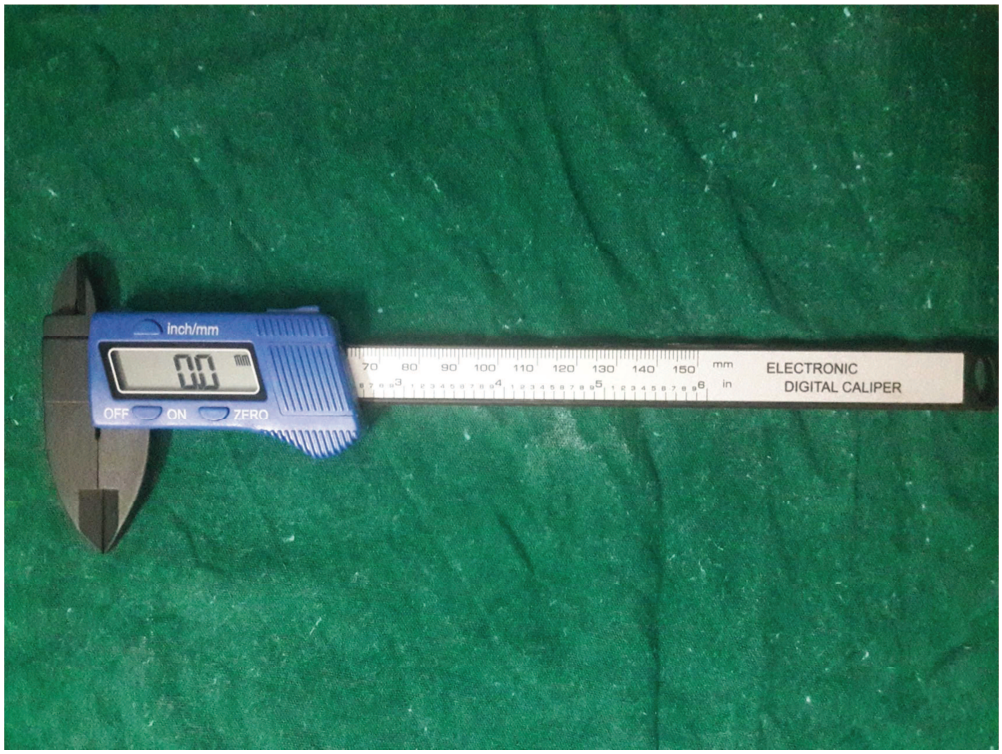
gently placed in the lateral canthus of one eye to the lateral canthus and the distance is noted in the data sheet.

Precautions taken during measurement were included cleanliness of instrument, check for zero error and check parallel error (error due to wrong positioning of the eye).

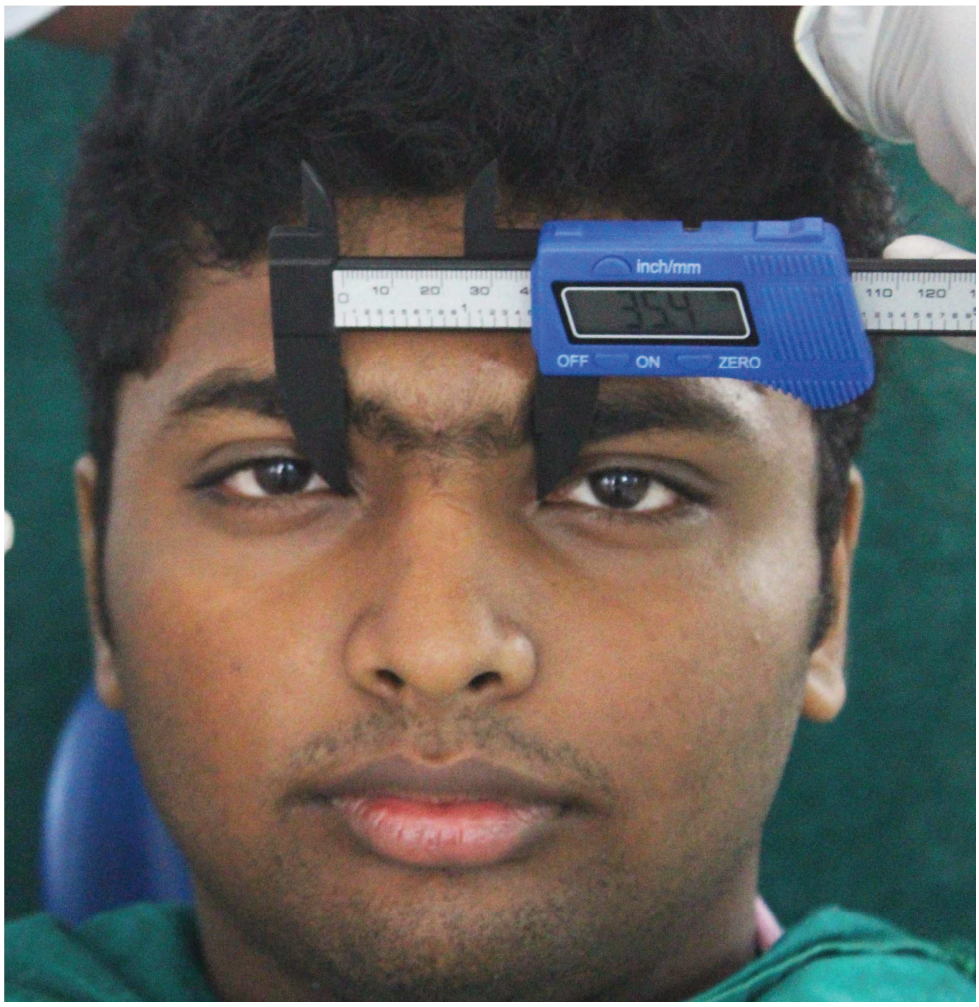
DATA SHEET:

Sl. No	AGE in years	Sex (male or female)	Intercanthal distance (ICD) in mm	Outercanthal distance (OCD) in mm

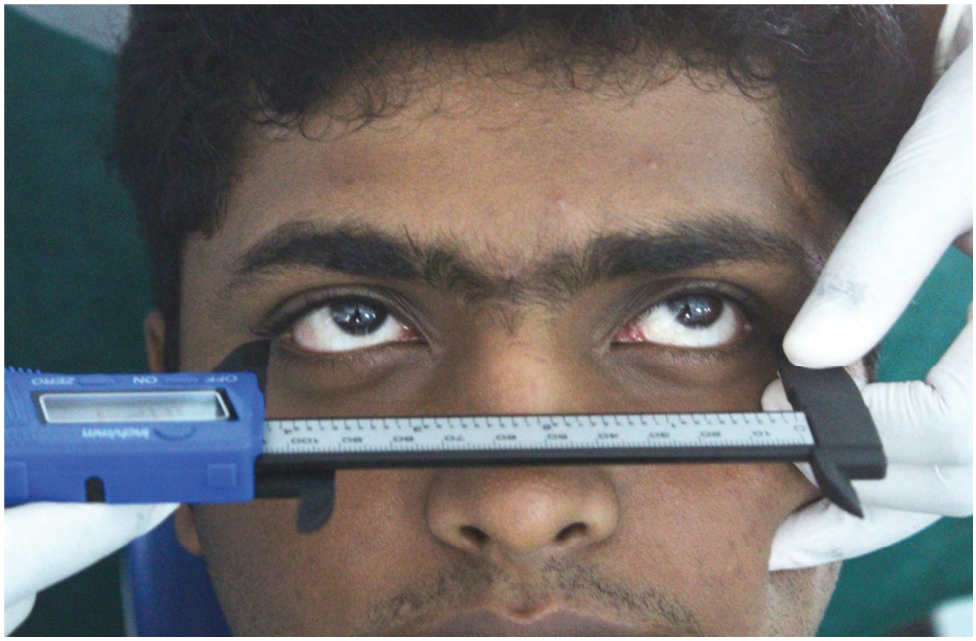
Color Plates



CP. 1 VERNIER CALLIPER



CP. 2 MEASUREMENT OF INNER-INTERCANTHAL DISTANCE



CP.3 MEASUREMENT OF OUTER-INTERCANTHAL DISTANCE

Results & Observations

The purpose of this study is to evaluate the normative inner-intercanthal and outer-intercanthal distance in kanykumari population. The difference in the values with age and gender should be evaluated. A total of 240 individuals including 120 males and 120 females from the age of 7- 40 years were enrolled in the study.

Baseline data for IICD and OICD were record in all the individuals. From the recorded values the mean for male and female will be found out. Also, these recorded values can serve for diagnosis of craniofacial anomalies , as a reference value for correction of traumatic telecanthus, forensic purposes in this local population.

Statistical analysis:

The data was expressed in number, percentage, mean and standard deviation. Statistical Package for Social Sciences (SPSS 16.0) version used for analysis. ANOVA (Post hoc) followed by Dunnet t test and Chi square test applied to find the statistical significant between the groups. P value less than 0.05 ($p<0.05$) considered statically significant at 95% confidence interval.

Table-1: Distribution of individuals based on age

Age (Years)	Number	Percentage (%)
7-20 years	80	33.33
21-30 years	77	32.08
31-40 years	83	34.58
Total	240	100.00

(p>0.05 no significant difference compared between the age)

Graph-1: Distribution of individuals based on age

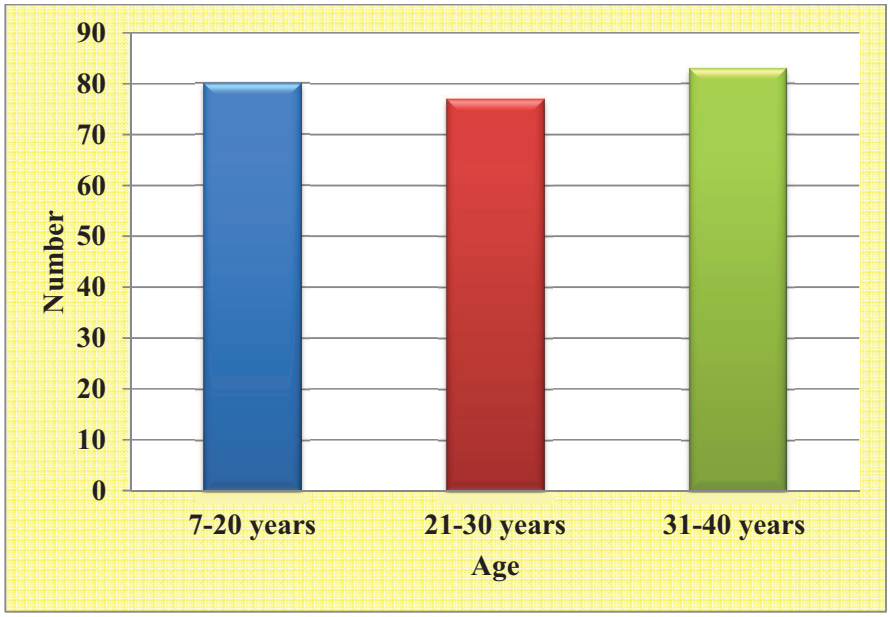


Table-2: Distribution of individuals based on gender

Gender	Number	Percentage (%)
Male	120	50.00
Female	120	50.00
Total	240	100.00

(p>0.05 no significant difference compared between the gender)

Graph-2: Distribution of individuals based on gender

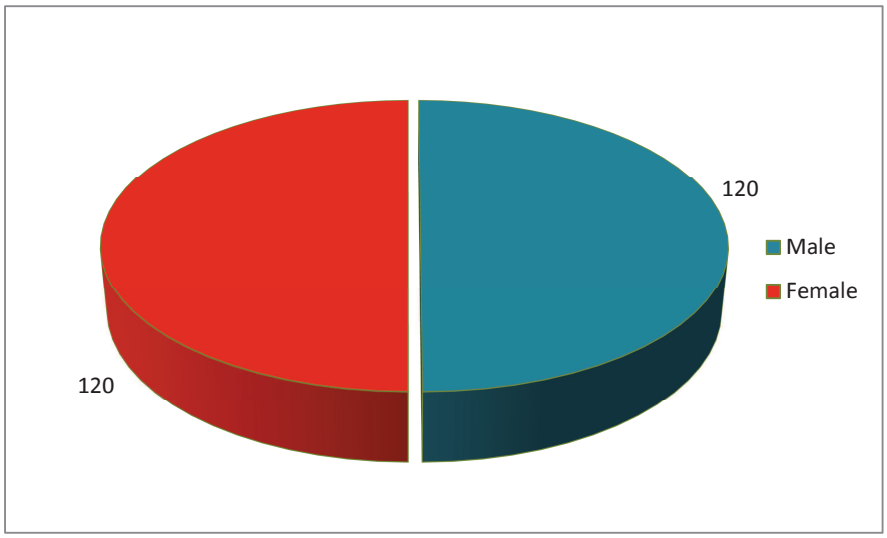


Table-3: Mean inter canthal and outer canthal distance of the individuals

Distance	Distance (mm) (MEAN±SD)
Inter canthal	32.75±2.54
Outer canthal	100.88±58.80

Graph-3: Mean inter canthal and outer canthal distance of the individuals

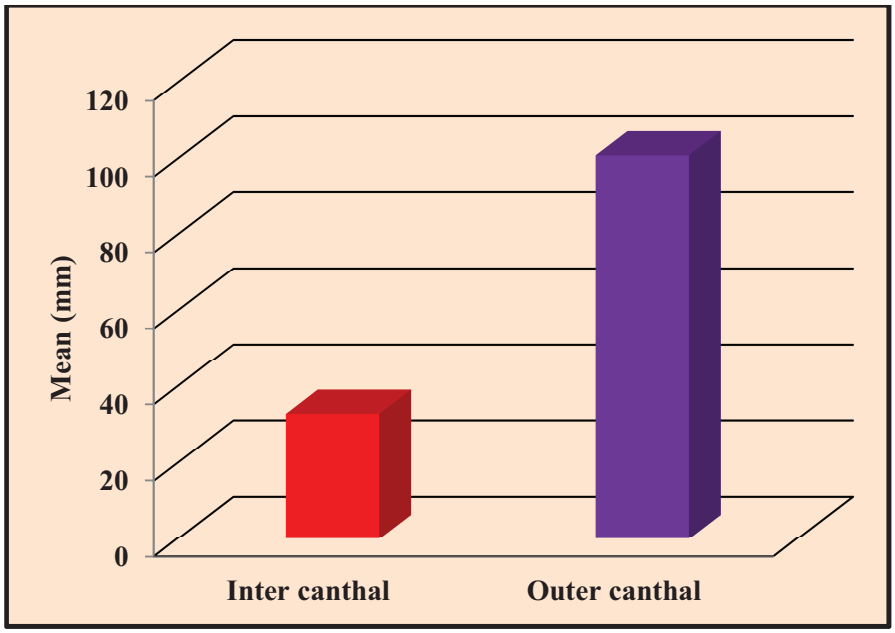


Table-6: Correlation of individuals gender with inter canthal distance

Gender	Inter canthal distance (mm) (MEAN±SD)	p value
Male	30.45±2.19	2.90
Female	31.94±1.89	

(p>0.05 no significant difference compared between the gender)

Graph-4: Correlation of individuals gender with inter canthal distance

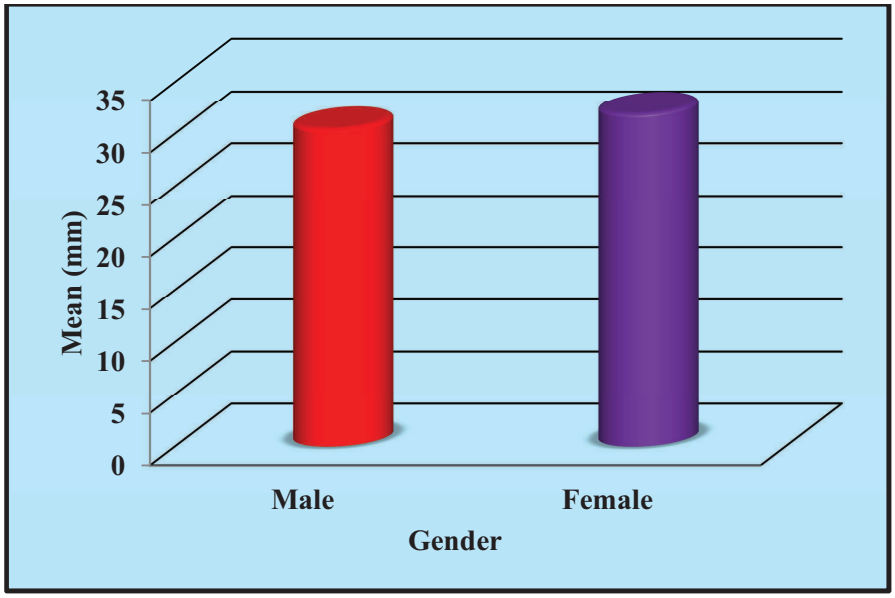


Table-7: Correlation of individuals gender with outer canthal distance

Gender	Outer canthal distance (mm) (MEAN±SD)	p value
Male	99.23±1.45	**1.84**
Female	100.94±2.45	

(p>0.05 no significant difference compared between the gender)

Graph-5: Correlation of individuals gender with outer canthal distance

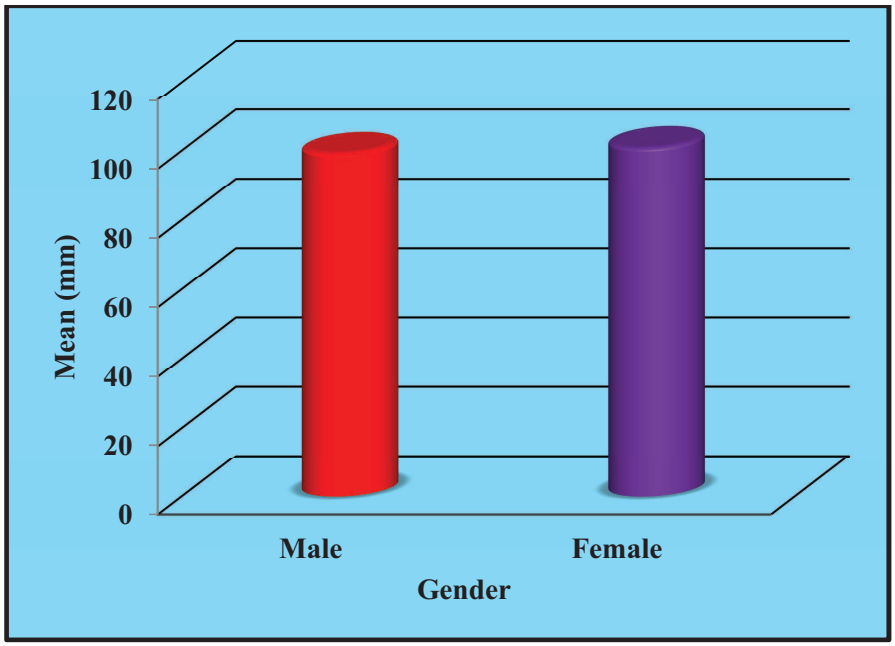


Table-4: Correlation of individuals age with inter canthal distance

Age (Years)	Inter canthal distance (mm) (MEAN±SD)	p value
7-20 years	31.78±1.29	**0.90**
21-30 years	32.72±2.09	
31-40 years	33.77±1.89	

(p>0.05 no significant difference compared between the age)

Graph-6: Correlation of individuals age with inter canthal distance

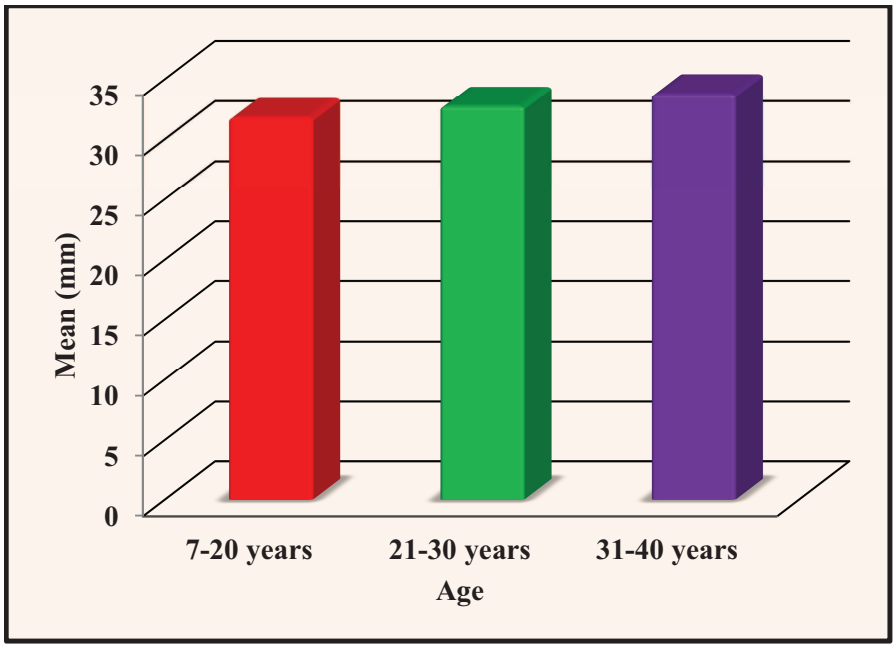


Table-5: Correlation of individuals age with outer canthal distance

Age (Years)	Outer canthal distance (mm) (MEAN±SD)	p value
7-20 years	98.89±1.35	**0.76**
21-30 years	99.92±2.78	
31-40 years	100.98±3.89	

(p>0.05 no significant difference compared between the age)

Graph-7: Correlation of individuals age with outer canthal distance

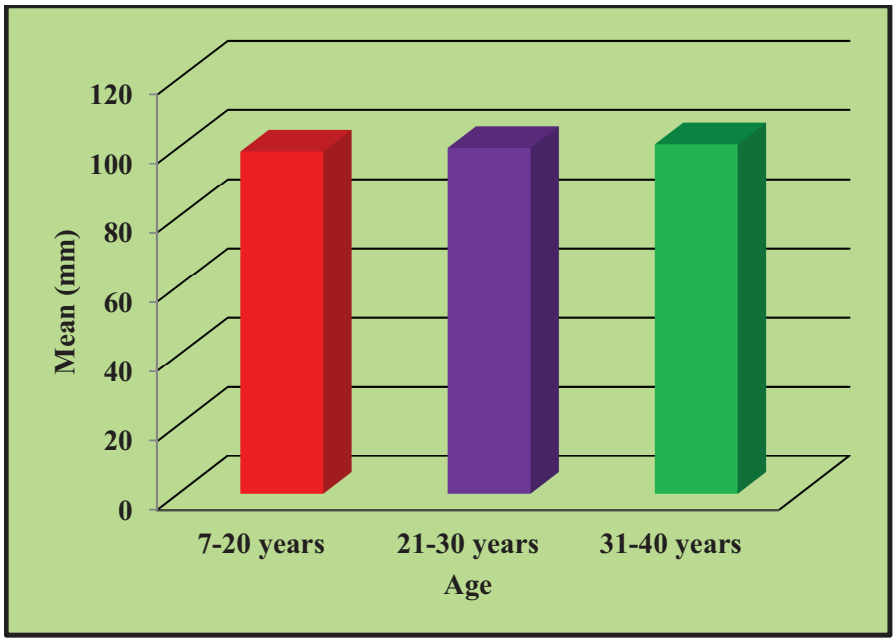


Table-6: Correlation of age gender with inner intercanthal distance

Age (Years)	Inner canthal distance (mm) (MEAN±SD)		p value
	Male	Female	
7-20 years	30.12±2.89	31.89±1.89	**1.89**
21-30 years	31.45±1.34	32.91±2.73	
31-40 years	32.12±3.24	33.12±4.12	

(p>0.05 no significant difference compared between the gender)

Graph-8: Correlation of age gender with inner intercanthal distance

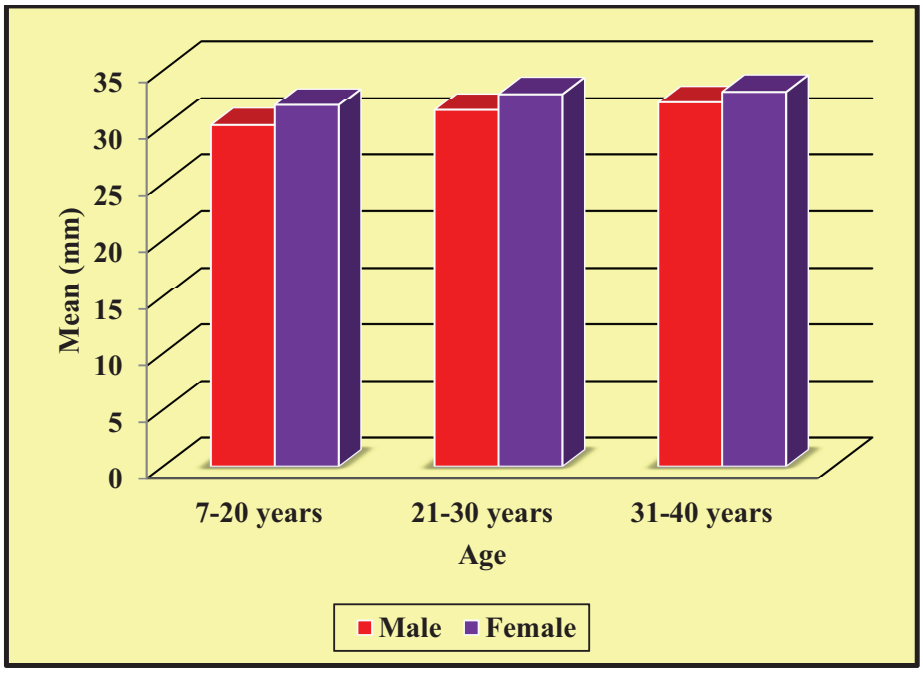


Table-7: Correlation of age gender with outer canthal distance

Age (Years)	Outer canthal distance (mm) (MEAN±SD)		p value
	Male	Female	
7-20 years	97.90±2.89	98.34±1.45	**1.92**
21-30 years	99.12±2.10	99.45±2.18	
31-40 years	99.93±1.93	100.23±1.12	

(p>0.05 no significant difference compared between the gender)

Graph-9: Correlation of age gender with outer canthal distance

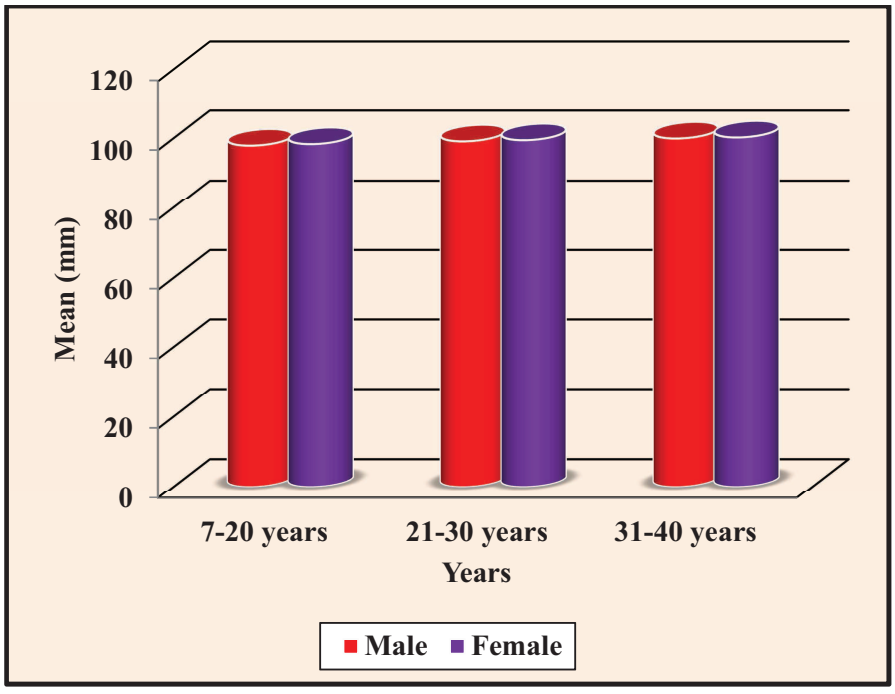


Table-8: Correlation of present study inner intercanthal distance with other Indian studies with gender

Gender	Inter canthal distance (mm) (MEAN±SD)	Vasanthakumar et al (mm) (MEAN±SD)	Singh et al 1983 (mm) (MEAN±SD)	p vale
Male	30.45±2.19	34.27±3.57	31.5±0.24	**0.23**
Female	31.94±1.89	33.41±3.09	30.9±0.28	

(p>0.05 no significant)

Table-9: Correlation of present study outer canthal distance with other Indian studies with gender

Gender	Outer canthal distance (mm) (MEAN±SD)	Vasanthakumar et al (mm) (MEAN±SD)	Singh et al 1983 (mm) (MEAN±SD)	p value
Male	99.23±1.45	95.55±6.39	30.9±0.28	**1.23**
Female	100.94±2.45	92.44 ±5.71	81.7±0.33	

(p>0.05 no significant)

Table-10: Correlation of present study of inter canthal distance with other country studies with gender

Gender	Inter canthal distance (mm) (MEAN±SD)	Yasas et al(chinese) (mm) (MEAN±SD)	Oladipo et al (Nigerian) (mm) (MEAN±SD)	p value
Male	30.45±2.19	40.61±4.91	38.90	**0.04**
Female	31.94±1.89	38.27±2.61	37.30	

(*p>0.05 no significant)

Table-11: Correlation of present study of outer canthal distance with other country studies with gender

Gender	Outer canthal distance (mm) (MEAN±SD)	Yasas et al (chinese) (mm) (MEAN±SD)	Oladipo et al (nigerian) (mm) (MEAN±SD)	p value
Male	99.23±1.45	93.00±5.56	107.60±0.25	**0.03**
Female	100.94±2.45	88.39±3.74	104.50±0.78	

(*p>0.05 no significant)

Table no 1: Distribution of individuals based on age. Totally 240 patients were enrolled in the study which includes both male and female . No of individuals in the age group of 7-20 years is 80 which constitute 33.33%. No of individuals in the age group of 21-30 years is 77 which constitute 32.08 %.No of individuals in 31-40 years is 83 which constitute 34.58 % .

Table no 2: Distribution of individuals based on gender. In a total of 240 individuals 120 males and 120 females were equally enrolled in the study.

Table no 3: Compromise of mean inner-intercanthal and outercanthal distance of the individuals. The inner-intercanthal distance is found to me 32.75±2.54 and outercanthal distance is found to be 100.88±58.80mm .

Table no 4: Correlation of individuals age with inter canthal distance . In 7-20 years age group the IICD is 31.78±1.29mm,21-30 years is 32.72±2.09mm,31-40years 33.77±1.89mm. There is no significant difference in IICD between the age groups.

Table no 5: Correlation of individuals age with outer canthus distance. In 7-20 year sage group the OICD is 98.89±1.35mm, in 21-30 years age group it is 99.92±2.78mm, in 31-40 years age group it is 100.98±3.89mm. ther is no significant difference of OICD between the age groups.

Table no 6: Comparison of age, gender of individuals with the Inner-intercanthal distance. In 7-20 years of males the IICD is 30.12±2.89mm, females it is 31.89±1.89mm. In 21-30 years of age in males the IICD is 31.45±1.34mm, in females it is 31.91±2.73mm, in 31-40 years it is 32.12±3.24mm in male , in females it is 33.12±4.12mm. There is no significant difference in IICD in between the age groups in male as well as in females.

Table no 7: Correlation of age , gender of individuals with outercanthal distance. In 7-20 years of age in male the OICD is 97.90±2.89mm, in females it is 98.34±1.45mm, in 21-30 years of age group in males it is 99.12±2.10mm, in females it is 99.45±2.18mm. In 31-40 years of age group th OICD in males it is 99.93±1.93mm, in females it is 100.23±1.12mm. There is no significant difference in OICD between the age groups in males and females .

Table no 8: Correction of present study inner intercanthal distance with other Indian studies with gender. The IICD obtained in our study in males is compared with the IICD of males in other Indian studies . There is no significant difference of IICD in males in between the studies. Also it is compared with values obtained in females in our study with that of the values of females in other Indian studies. There is no significant difference of IICD in females in between the studies.

Table no 9: Correction of present study outer intercanthal distance with other Indian studies with gender . The OICD obtained in our study in males is compared with the OICD of males in other Indian studies . There is no significant difference of OICD in males in between the studies . Also it is compared with values obtained in females in our study with that of the values of females in other Indian studies. There is no significant difference of OICD in females in between the studies.

Table no 10 : Correction of present study inner intercanthal distance with other country studies with gender . The IICD obtained in our study in males is compared with the IICD of males in other studies conducted in Nigeria , Hong kong. There is no significant difference of IICD in males in between the studies. Also it is compared with values obtained in females in our study with that of the values of

females in other country studies. There is no significant difference of IICD in females in between the studies.

Table no 11: Correction of present study outer intercanthal distance with other country studies with gender . The OICD obtained in our study in males is compared with the OICD of males in other studies conducted in Nigeria , Hong kong. There is no significant difference of OICD in males in between the studies . Also it is compared with values obtained in females in our study with that of the values of females in other country studies. There is no significant difference of IICD in females in between the studies

Discussion

The attractiveness of the face is as the result of the relationship between the symmetry of its part. The aesthetics of face depends on all anatomic structures. The most sensitive area of the face is the orbitonasal area, even a small difference cause disharmony, asymmetry and disproportion. In facial surgery, determination of any l disproportion of the face with the help of indices is invaluable both before and after the operation. The importance of facial proportions in different races has been declared by several surgeons.[51]

Canthus is either corner of the eye where the upper and lower eyelids meet is called Medial or nasal canthus is the inner canthus and lateral canthus is the outer canthus. The fleshy, pink lachrymal caruncle and the canaliculi which lead into the lachrymal sac represent the inner canthus[52]. Inter canthal distance is one the facial parameters which serve as a useful tool in the medical genetics as many of the syndromes present at birth usually involves the head and the face.[47] During embryogenesis and after birth the distance between the orbits varies[31].

Soft tissue variations such as telecanthus could result in a pseudo hypertelorism or primary telecanthus where abnormality is confined to the soft tissue only. Establishing a nomogram for inner intercanthal distance (IICD) and outer intercanthal distance (OICD) in a normal population has important clinical implications.[52]

Accurate measurement of these distances serves as a diagnosing tool for finding hypertelorism. True hypertelorism is when both the IICD and OICD are wide apart. Diagnosis of hypertelorism plays a very important since it is a feature of various syndromes like faciodigitogenital dysplasia, Greig syndrome and optitz G syndrome.

Primary hypertelorism is one in which there is increase in inner canthal distance but outer-intercanthal distance will be normal. Illusionary hypertelorism may occur in people with flat nasal bridge, epicanthal folds, exortopia narrow palpebral fissure, widely spaced eyebrows and dystopia canthorum. For example, Trisomy 21 syndrome, epicanthic folds and flat nasal bridge both contribute to the illusion of hypertelorism, although measurements actually show ocular hypotelorism.[36]

Traumatic telecanthus resulting from NOE fractures is difficult to treat and it involve both aesthetic as well as functional aspect in the treatment. Inadequate or delayed treatment of these fractures can result in scarring in the region and can give poor results post-operatively[11].

These values are also serve as a tool to diagnose traumatic telecanthus which is an important clinical sign associated with NOE fractures. Successful management of NOE fracture requires both soft tissue as well as hard tissue is consideration. Misdiagnosis or inadequate treatment of these fractures can result in facial deformities.[12]

Many dysmorphic syndromes can be diagnosed based not only on advanced cytogenetic and molecular techniques, but also on recognition of subtle morphological anomalies in craniofacial region. Dysmorphic characters are usually reported by clinicians in descriptive terms such as “wide-set eyes”, “broad nose”, and “largemouth”. However, such description is subjective. Anthropometrical measurements can overcome these problems. Measurements taken from a patient can be compared with the values obtained in the normal population, and deviations from the normative values can be evaluated.[34]

It has been demonstrated that genetics, environmental factors, gender and age results in variations of the considered parameters.[44] The normal database available for one ethnic group may not represent the other ethnic group. So a standard for each specific group is necessary.

In our study the inner-intercanthal distance and outer-intercanthal distance are studied in 240 people which includes 120 male and 120 females in kanyakumari population. The distances are measured using digital vernier calliper. In this study, it was found out that the mean inner-intercanthal distance is 32.75 ±2.54 mm and outer-intercanthal distance is 100.88 ± 58.80 mm in Kanyakumari population.

The mean IICD in males in our population is 30.45±2.19 mm and in females is 31.94±1.89 mm. There is no significant difference between gender. The values are higher in females than the males. While in a study conducted by Vasanthakumar et al in south Indian population the mean IICD in males is found to be 34.27± 3.57mm and female is 33.41±3.09mm.[6] These values are higher than the values obtained in our study. Moreover, in this study the IICD in males is higher than the females while in over study it is higher for females. In a study by Oladipo et al in Nigerian population the IICD in males and females are 38.1±2.33mm and 36±1.69mm respectively.[16] These values are much higher than the values obtained in our population. Also, there is significant difference in IICD between males and females. In Nigerian population the values in males are higher than the females while in our study its vice versa. In a study by Amal AB et al in Saudi population and concluded that there is no significant difference in the mean values of IICD and OICD with regards to age and gender.[42] This result coincides with our result.

The mean OICD in males in this study is 99.23±1.45mm and in females is 100.94±2.45mm. There is no significant difference between males and females. In a study by Vasanthakumar et al the OICD in males is 95.55±6.39 mm and in females is 92.44±4.71mm. These values showed significant difference. Also, when compared with our study these values are lower. Moreover, in this study the values obtained in males is higher than the females while in our study the values obtained in females are higher than the males. This clearly makes that there is difference in IICD and OICD with region, specific race and ethnic group. In a study by Oladipo et al in Nigerian population the mean OICD values obtained in males and females are 107.6±3.78mm and 104.5±3.22mm respectively. There is significant difference between the gender in this population. The values obtained in Nigerian population is lower than the values obtained in our population.[16]

The mean IICD in the age groups of 7-20 years is 31.78±1.29mm, in 21-30 years is 32.72±2.09mm, in 31-40 years is 33.77±1.89mm. when the values are compared between the age groups the IICD is 7-20 is lower than the mean IICD of 21-30 years this again lower than in the obtained values of 31-40 years. But there is no significant difference in the values between the age groups.

Agarwal et al studied the IICD in Chhattisgarh population in which the values in different age groups and concluded that the age IICD in children is lower than the adults .This coincides with our result.[7] Kalpit et al in a his study observed that the IICD increased till 16 years of age and which they observed a plateau. Also this value increase only after 1 month . IICD growth was steady in the first decade of life and after this there is minimal increase in the value which is due to orbital

divergence as the age advances.[17] This result coincides in the part that there is increase minimal increase in the parameter as age advances.

In this study the mean OICD in the age of 7-20 years is 98.89±1.35mm, in 21-30 years is 99.92±2.78mm and 31-40 years is 100.98±3.89mm. The OICD in children is lower than the young adults whereas the OICD in adults is higher than the young adults. Therefore, it is clearly evident that there is a gradual increase in OICD with age. Similarly in a study by Agarwal et al he stated that the OICD in adults is higher than the values obtained in children.[7] Kalpit et al in his study stated that there is no change in the value of OICD until 1 month after which there is an increase in the value. 16-20 years OICD is stabilized and then they observed a plteau. There is faster growth of OICD in first two years of life. But in our study there is a steady gradual increase in OICD.[17]

The mean IICD in males in the age groups of 7-20 years is 30.12±2.89mm, 21-30 years is 31.45± 1.34mm, 31-40 years is 32.12± 3.24mm. In females the values for each age group were 31.89±1.89 mm for 7-20 years, 32.91±2.73 mm for 21-30 years and 33.12± 4.12 for 30-40 year. There is no significant difference between the age groups in the males and females. But there is gradual increase in the IICD in this population with respect to age and gender. Mean IICD in female is higher than the male in our population. Agarwal et al in his study in males and females of Chhattisgarh population in the age groups of 7-14 years is 30.53 ±1.07mm, 30.44 ± 1.41mm,14-25 years is 31.82±1.87mm, 31.70 ± 2.22mm, 25-40 years is 32.50±2.82mm, 32.00 ± 2.67mm obtained respectively. Also there is gradual increase in the values as the age increases in males as well as females . In all the age groups the values in males is higher than the females.[6] But in our study the values

obtained in females are higher than the males. Gupta et al in a study in Indian population found out that there is significant difference in IICD between male and female in all but not in first and seventh decades.[35] But in our study there is gradual increase in values in both the gender. And there is no significant difference between the gender in any of the age groups.

The mean OICD in males and females in 7-20 years are 97.90±2.89mm, 98.34±1.45 mm, in 21-30 years is 99.12±2.10 mm, 99.45±2.18 mm, 31-40 years is 99.93±1.93 mm, 100.23± 1.12mm respectively. There is no significant difference in the values with respect to gender in all the age group . But in all the age groups the values in females are higher than the male. While in a study by Agarwal et al the OICD in males and females in the age groups of 7-14 years is 92.57 ± 2.18mm, 91.89 ± 1.96 mm, in 14- 25 years is 92.23 ± 1.87mm, 95.69 ± 1.62mm , in 25-40 years is 96.10 ± 3.13mm, 94.40 ± 3.16mm respectively.[7] These values in each age group in both male and female is lower than the values obtained in our study. in our study the OICD in females in the age groups of 7-20 years and 31-40 years are higher than the values obtained in males , in 21-30 the values obtained in both the gender are almost same. while in Agarwal et al 's study the values obtained in all the age groups are higher in males than in females. Gupta et al in his study observed by that OICD reached adult dimensions by the second decade and varied little after that. They also found a significant difference in the values of OICD in males and females in the third, fifth, sixth & eighth decades.[35]

The mean values of IICD and OICD in males and females is compared with values in other studies. In our study the IICD and OICD in females (31.94± 1.89 mm) and (100.94±2.45mm) respectively, while in a study conducted by Singh et al

in Punjab population for females the mean ICD was (30.9±0.2862) and OCD was (81.7±0.3310mm). The values were also compared with the values got by Vasanthakumar et al in which the OICD 33.41±3.09 is mm and IICD 92.44 ±5.71 is mm. Comparing both studies there is no significant statistical difference between the females.[6] But the outercanthal distance in females in Punjab is lower than the OICD in our population. The OICD and IICD in male populations is found to be (30.45 ± 2.19) and (99.23 ±1.45mm) respectively, while in Singh et al's study the IICD and OICD in male population is found to be 31.5±0.24mm and 99.23±1.45mm.[26] Further , the values were compared with study by Vasanthakumar et al IICD is 34.27±3.57mm and OICD is 95.55±6.39mm .There is no significant difference between the two population.

The obtained values were compared with the values obtained by oladipo et al in Nigerian population in which the IICD in males is 38.90mm and in females is 37.30mm .These values are higher than the values obtained in our study. while the OICD in Nigerian population in males is 107.60±0.25mm and in females is 104.50±0.78mm.[17] These values are higher than the values obtained in our study. Also there is statistical significance present when these values were compared.

Usman et al in his study in subject of Nigerian population got a mean IICD and OICD in males as 42±5mm and 111±14mm respectively. In females it is 39± 3mm for IICD and 120 ± 7 mm. These values are higher than the values obtained in our study .[49] This can be due to the racial difference between the Indian and Nigerian population.

In a study by Meltam et al in Turkish population the mean IICD in males and females is 28.68 ± 3.61mm, 27.84±2.90 mm respectively and the OICD is

96.43± 11.90 mm, 95.08 ± 9.85 mm respectively. Both the values of IICD and OICD are lower in our population when compared with Turkish population. In a study by Mohammad ER et al on Iran population found out that the IICD and OICD in males are 29.16 ±3.31mm and 78.86±7.7mm and in females is 29.2±3.4mm and 80.45±9.22mm.[51] These values are lower than the values in our study.

When comparing the obtained values with the study by Yasas et al in Hong Kong population , IICD is lower in the males and females in our population while the OICD in Hong kong population is lower than the values obtained in our study.[45] There is significant difference present between the two population. This clearly gives the importance of studying normative values in each specific group.

This study is undertaken to find the normative inner-intercanthal and outer-intercanthal distance in kanyakumari district population. In our study the inner intercanthal distance as well as the outer intercanthal distance in females is higher than the males. While in most of the studies the values obtained in males is higher than the males . This forms the main significance of the study . This clearly give the importance of studying the normative values in a particular population. These changes could be due to change in environment racial difference associated with this population.

We also suggest that the obtained values can be used for diagnosis of hypertelorism such as holoprosencephaly, Meckel Gruber syndrome, Coffins Siris syndrome and Williams syndromes, in construction of spectacles, for more accurate correction of traumatic telecanthus, for aesthetic surgeries such as blepharoplasty, in forensic studies in our population.

Summary

Inner inter-canthal and outer inter-canthal distance varies according to ethnicity, race, environment. In our study inner-intercanthal distance and outer -intercanthal distance in Kanyakumari population is studied. 240 individuals including 120 males and 120 females were enrolled in the study.

The study found out that;

- The mean inner intercanthal and outer intercanthal distance in Kanyakumari population is 32.75 ±2.54 mm and 100.88 ± 58.80 mm respectively.

- The mean IICD in 7-20 years is 31.78±1.29mm, 21-30 years is 32.72±2.09 mm, 31-40 years is 33.77±1.89mm.There is no significant difference between the age groups and the mean OICD in age of 7-20 years is 98.89±1.35mm, 21-30 years is 99.92±2.78mm, 31-40 years is 100.98±3.89mm. . No significance of the values in each group is found.

- The mean IICD in males in age groups is 7-20 years is 30.12±2.89 mm, 21-30 years is 31.45±1.34 mm, 31-40 years is 32.12±3.24mm. . No significance of the values in each group is found.

- The mean IICD in females in age groups is 7-20 years is 31.89±1.89mm, 21-30 years is 32.91±2.73, 31-40 years is33.12±4.12mm. No significance of the values in each group is found.

- The mean OICD in males in age groups is 7-20 years is 97.90±2.89mm, 21-30 years is 99.12±2.10 mm,31-40 is 99.93±1.93 mm. No significance of the values in each group is found.

- The mean OICD in females in age groups is 7-20 years is 98.34±1.45mm, 21-30 years is 99.45±2.18mm,31-40 is 100.23±1.12mm. No significance of the values in each group is found.

- There is no significance of the values with respect to age, gender in this population, the values in females is found to be higher than the males.

Conclusion

The mean IICD and OICD in Kanyakumari population is found out in this study. The values of OICD and IICD in females is higher than the values of OICD and IICD in males. There is much difference in the values when compared other ethnic groups. This normative value developed can be used in further reduction of NOE fractures, to diagnose syndromes in our population. Since India is a country with different ethnic groups more studies in different population should be taken up to develop specific normative values.

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Annexure

SREE MOOKAMBIKA INSTITUTE OF DENTAL SCIENCES

KULASEKHARAM, KANYAKUMARI DIST., TAMIL NADU, INDIA.

INSTITUTIONAL RESEARCH COMMITTEE

Certificate

This is to certify that the research project protocol, ***Ref no. 14/07/2016*** titled, ***"Orbitofacial anthropometric assessment of inner-intercanthal and outer-intercanthal distance in Kanyakumari population- an in vivo study"*** submitted by ***Dr. T. Harinee, II Year MDS, Department of Oral and Maxillofacial Surgery*** has been approved by the Institutional Research Committee at its meeting held on ***26th July 2016.***

Convener
Dr. T. Sreelal

Secretary
Dr. Pradeesh Sathyan

INSTITUTIONAL HUMAN ETHICS COMMITTEE

SREE MOOKAMBIKA INSTITUTE OF MEDICAL SCIENCES,
KULASEKHARAM, TAMILNADU

Communication of Decision of the Institutional Human Ethics Committee(IHEC)1

SMIMS/IHEC No.1 /Protocol no. 21 / 2016

Protocol title: Orbitofacial anthropometric assessment of inner – interCanthal and outer interCanthal distance in Kanyakumari population - an invivo study
Principal Investigator: Dr. T.Harinee
Name& Address of Institution: Department of Oral &Maxillofacial Surgery Sree Mookambika Institute of Medical Sciences, Kulasekharam ☑ New review ☐ Revised review ☐ Expedited review
Date of review (D/M/Y): 14.12.2016 Date of previous review , if revised application:
Decision of the IHEC: ☑ Recommended ☐ Recommended with suggestions ☐ Revision ☐ Rejected
Suggestions/ Reasons/ Remarks:
Recommended for a period of : one year

Please note*

- Inform IHEC immediately in case of any Adverse events and Serious adverse events.
- Inform IHEC in case of any change of study procedure, site and investigator
- This permission is only for period mentioned above. Annual report to be submitted to IHEC.
- Members of IHEC have right to monitor the trial with prior intimation.

Reneegalyangadhar

Signature of Member Secretary IHEC

SREE MOOKAMBIKA INSTITUTE OF MEDICAL SCIENCES ★ KULASEKHARAM ★
IHEC
Date..23/12/16

INFORMED CONSENT DOCUMENT (ICD)

Patient / Participant information sheet

INFORMATION FOR PARTICIPANTS OF THE STUDY

Dear Volunteers,

We welcome you and thank you for your keen interest in participation in this research project. Before you participate in this study, it is important for you to understand why this research is being carried out. This form will provide you all the relevant details of this research. It will explain the nature, the purpose, the benefits, the risks, the discomforts, the precautions and the information about how this project will be carried out. It is important that you read and understand the contents of the form carefully. This form may contain certain scientific terms and hence, if you have any doubts or if you want more information, you are free to ask the study personnel or the contact person mentioned below before you give your consent and also at any time during the entire course of the project.

1. Title of the study: "Orbitofacial anthropometric assessment of inner-intercanthal and outer-intercanthal distance in Kanyakumari population- an invivo study"
2. Name of the Principal Investigator: Dr. T. Harinee.
   Name of the Guide: Dr. N. Dhineksh Kumar.
   Name of the Co-Guide: Dr. Mathew Jose.
3. **Purpose of the study:**
   - To find out the normal inter and outer canthal distance using vernier caliper.
   - Finding the difference in inter canthal and outer canthal distance with aging.
   - Evaluating the difference between the inter canthal and outercanthal distance between gender.
4. **Procedure for the study:**
   Once you are enrolled into the study, a study no will be implemented to represent the name. Individuals fulfilling the inclusion and exclusion criteria in the study will be taken to the department of oral and maxillofacial surgery of Sree Mookambika institute of dental sciences. You will be seated comfortably in the dental chair in a relaxed state and in an upright position with your head at the

same level as the examiner's head.The vernier caliper will be gently placed on the medial canthus and outer canthus of the eyes and the Inter-canthal and outer-canthal distance will be measured respectively. Precautions taken during measurement were included cleanliness of instrument , check for zero error and check parallel error (error due to wrong positioning of the eye).

5. Expected duration of the subject participation in the study: 1 Year

6. Expected risks for the participants: No risk.

7. Expected benefits of research for the participants:
    - You will not be required to pay for this test.
    - You can enquire about the outcome of the procedures and your details

8. Maintenance of confidentiality:

- You have the right to confidentiality regarding the privacy of your medical information
  (Personal details, results of physical examinations, investigations, and your medical history).
- By signing this document, you will be allowing the research team investigators, other study Personnel, sponsors, institutional ethics committee and any person or agency required by law to view your data, if required.
- The results of clinical tests and therapy performed as part of this research may be included in your medical record.
- The information from this study, if published in scientific journals or presented at scientific meetings, will not reveal your identity.

9. Agreement of compensation to the participants (In case of a study related injury):
   Patient will be taken care in case of complication and medical treatment will be provided in the institution.

10. Compensation to the participants for forseeable risks and unforeseeable risks related to research study leading to disablilty or death?
    No risk to death

11. Can I withdraw from the study at any time during the study period?

The participation in this research is purely voluntary and you have the right to withdraw from this study at any time during the course of the study without giving any reasons.

However, it is advisable that you talk to the research team prior to stopping information.

12. If there is any new findings/information, would I be informed? Yes

13. Any other pertinent information: No other information

14. Whom do I contact for further information?

For any study related queries, you are free to contact:

Dr. T. Harinee,
Post Graduate student.
Department of Oral and maxillofacial surgery,
Sree Mookambika Institute of Dental Sciences,
Kulasekaram,
KanyaKumari District-629161.
Mobile No: 7639658631.
harident09@gmail.com

Signature of Principal Investigator

Place:

Date:

Signature/ Thumb impression of the participant

സമ്മത പത്രം - ഭാഗം - 1

പഠനവുമായി സഹകരിക്കുന്ന വ്യക്തികളുടെ അറിവിലേയ്ക്ക്

പ്രിയപ്പെട്ട സന്നദ്ധ സേവകരേ,

ഞങ്ങൾ നിങ്ങളെ സ്വാഗതം ചെയ്യുന്നു. അതോടൊപ്പം ഈ പഠനവുമായി സഹകരിക്കാനുള്ള സന്നദ്ധതയോട് നന്ദി രേഖപ്പെടുത്തുന്നു. നിങ്ങൾ ഈ പഠനത്തിൽ പങ്കെടുക്കുന്നതിനു മുൻപ് ഈ പഠനം എന്തിനാണ് നടത്തപ്പെടുന്നത് എന്ന് അറിയേണ്ടതുണ്ട്. അതിനാൽ ഈ ഫോറത്തിൽ ഗവേഷണ പഠനത്തിന്റെ വിവരങ്ങളും മറ്റും വിശദമായി രേഖപ്പെടുത്തിയിരിക്കുന്നു. ഈ പഠനത്തിന്റെ രീതി, ഉദ്ദേശം, പ്രയോജനം, അപകടസാദ്ധ്യത, ക്ലേശം, മുൻകരുതൽ, എങ്ങനെ ഈ പഠനം മുൻപോട്ടു കൊണ്ടുപോകുന്നു എന്നിങ്ങനെ എല്ലാ വിവരങ്ങളും ഫോറത്തിൽ രേഖപ്പെടുത്തിയിരിക്കുന്നു. സദയം ഈ വിവരങ്ങൾ വായിച്ചു മനസ്സിലാക്കുവാൻ അഭ്യർത്ഥിക്കുന്നു. ഈ വിവരങ്ങളിൽ ശാസ്ത്രപരമായ പദങ്ങൾ ഉള്ളതിനാൽ സംശയനിവാരണത്തിനു പ്രധാന പഠനകർത്താവിനോടോ താഴെ രേഖപ്പെടുത്തി യിരിക്കുന്ന വ്യക്തികളോടോ ഫോറം ഒപ്പിടുന്നതിനു മുൻപോ അല്ലെങ്കിൽ ഈ പഠനത്തിന്റെ കാലാവധി തീരുന്നതുവരേയോ സമീപിക്കാവുന്നതാണ്.

1. പഠന വിഷയം:

കന്യാകുമാരി ജനതയിൽ ഇന്റർ കാൻന്തലും ഔട്ടർ കാൻന്തലും തമ്മിലുള്ള ദൂരം ഓർബിറ്റോഷേഷ്യൽ ആൻസ്രഫോമെട്രി ഉപയോഗിച്ച്നിർണ്ണയിക്കൽ

2. മുഖ്യ ഗവേഷകൻ : **ഡോ.റ്റി. ഹരിണി**

പ്രധാന മാർഗ്ഗദർശി: **ഡോ.ദിനക്ഷ് കുമാർ.**

സഹ മാർഗ്ഗ ദർശി : **ഡോ.മാത്യു ജോസ്**

3. ലക്ഷ്യങ്ങളും ഉദ്ദേശങ്ങളും ?

- സാധാരണ ഇന്റർ കാന്തലും ഔട്ടർ കാന്തലും തമ്മിലുള്ള വ്യത്യാസം വെർണിയർ കാലിപർ ഉപയോഗിച്ച് കണ്ടുപിടിക്കൽ
- പ്രായമേറുന്തോറും ഉണ്ടാകുന്ന ഇന്റർ കാന്തലും ഔട്ടർകാന്തലും തമ്മിലുള്ള ദൂരവ്യത്യാസം കണ്ടുപിടിക്കൽ
- ലിംഗത്തിന് അനുപാതമായി ഇന്റർ കാന്തലും ഔട്ടർകാന്തലും തമ്മിലുള്ള ദൂരവ്യത്യാസം നിർണ്ണയിക്കൽ.

4. പഠന രീതി

താങ്കളെ ഈ പഠനത്തിൽ ഉൾപ്പെടുത്തുമ്പോൾ താങ്കളുടെ പേരിനു പകരമായി ഒരു റോൾ നമ്പർ തരുന്നതാണ്. നിങ്ങളെ ഒരു ഡെന്റൽ കസേരയിൽ സുഖമായിട്ട് നിവർന്ന് ഇരുത്തുകയും നിങ്ങളുടെ ഈ പഠനം നടത്തുന്ന ആളിന്റെ തലയുടെ മുൻപിൽ വരത്തക്കവിധം ക്രമീകരിക്കുകയും ചെയ്യുന്നു. ഒരു വെർണിയർ കാലിപർ ഉള്ളിലേയും വെളിയിലേയും കാന്തസിൽ വെയ്ക്കുകയും ആ ദൂരങ്ങൾ അടയാളപ്പെടുത്തുകയും ചെയ്യുന്നു. ഇതിനുവേണ്ടി ഉപയോഗിക്കുന്ന സാധനങ്ങൾ വൃത്തിയുള്ളതാണെന്ന് ഉറപ്പുവരുത്തിയതാണ്.

5. പഠനം മൂലം പങ്കെടുക്കുന്ന ആൾക്ക് ഉണ്ടാകാൻ ഇടയുള്ള അപകട സാധ്യത -

അപകട സാദ്ധ്യത ഇല്ല.

6. രോഗികൾക്ക് പ്രതീക്ഷിക്കുന്ന ഗുണങ്ങൾ ?

രോഗി ആവശ്യപ്പെടുകയാണെങ്കിൽ ഈ പഠനത്തിനൊടുവിൽ ഏറ്റവും നല്ല ചികിത്സാരീതി നിർദ്ദേശിക്കുന്നതാണ്.

7. വിവരങ്ങൾ രഹസ്യമായി സൂക്ഷിക്കുമോ ? അതെ

8. പഠനം മൂലമുണ്ടാകുന്ന ക്ഷതങ്ങൾക്ക് നഷ്ടപരിഹാരത്തിനുള്ള സമ്മതം ?

പഠനകർത്താവ് ചികിത്സാ ചെലവ് വഹിക്കുന്നതാണ്.

9. ഏതെങ്കിലും വിധത്തിൽ വേതനം ലഭിക്കുമോ - ഇല്ല

10. എപ്പോൾ വേണമെങ്കിലും എനിക്ക് ഈ പഠനത്തിൽ നിന്ന് പിന്മാറാമോ -

സ്വന്തം താൽപര്യപ്രകാരം ഈ പഠനത്തിൽ നിന്ന് എപ്പോൾവേണമെങ്കിലും പിന്മാറാവുന്നതാണ് കാരണങ്ങൾ നൽകാതെ തന്നെ. എന്നിരുന്നാലും ഗവേഷണ സംഘത്തോട് പിന്മാറുന്നതിനുമുൻപ് സംസാരിക്കുവാൻ ഞങ്ങൾ നിങ്ങളോട് അഭ്യർത്ഥിക്കുന്നു.

11. ഈ ഗവേഷണത്തിന്റെ ഫലമായി പുതിയ എന്തെങ്കിലും കണ്ടെത്തലുകളുണ്ടെങ്കിൽ അത് എന്നെ അറിയിക്കുമോ ? അതെ

12. ഈ പഠനത്തിന്റെ സമയ ദൈർഘ്യം എത്രയാണ് ? ഒരു വർഷം

13. ഇതിന്റെ ഭാഗമായി എന്തെങ്കിലും കൂടുതൽ വിവരങ്ങൾ വേണ്ട

14. കൂടുതൽ വിവരങ്ങൾക്കായി താഴെ പറയുന്നവരെ നിങ്ങൾക്ക് ബന്ധപ്പെടാവുന്നതാണ്.

ഡോ.റ്റി. ഹരിണീ
പോസ്റ്റ്ഗ്രാജുവേറ്റ് വിദ്യാർത്ഥിനി (എം.ഡി.എസ്)
ഓറൽ ആന്റ് മാക്സില്ലോഫേഷ്യൽ സർജറി വിഭാഗം
ശ്രീ മൂകാംബിക ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് ഡെന്റൽ സയൻസ്,
കുലശേഖരം - 629 161.
മൊബൈൽ നമ്പർ :7639653631
ഇ-മെയിൽ ഐഡി:വമൃശറലി൦൭@ഴാമശഹ.രീാ

സ്ഥലം: പ്രഥമ അന്വേഷകന്റെ ഒപ്പ്

തീയതി :

പങ്കെടുക്കുന്ന ആളിന്റെ അച്ഛൻ/

രക്ഷകർത്താവ് / ബന്ധുവിന്റെ ഒപ്പ്

ஒப்புதல் வாக்குமூலம்
முதல் பாகம்
ஆராய்ச்சியில் பங்குபெறுவோருக்கான தகவல் குறிப்பு

அன்பார்ந்த பங்கேற்பாளர்களே,

இந்த ஆராய்ச்சியில் தங்களை ஈடுபடுத்திக்கொள்ள மிகுந்த ஆர்வத்துடன் முழுமனதுடன் கலந்துகொள்ள வந்த உங்களை வரவேற்கிறேன். நீங்கள் இந்த ஆராய்ச்சியில் பங்கெடுத்துக்கொள்வதற்கு முன் இந்த ஆராய்ச்சி எதற்காக நடத்தப்படுகிறது என்பதை தெளிவாக புரிந்துகொள்ள வேண்டும். உங்களுக்கு தேவையான அனைத்து விபரங்களும் கீழே கொடுக்கப்பட்டுள்ளது. இந்த ஆராய்ச்சியின் மூலம் ஏற்படும் நன்மைகள், ஏதேனும் ஆபத்துகள் மற்றும் அதற்காக மற்றும் எவ்வாறு இந்த ஆராய்ச்சி மேற்கொள்ளப்படும் முறைகளையும் தெரிவிக்கப்பட்டுள்ளது. இதில் கொடுக்கப்பட்டுள்ள விபரங்களை தெளிவாக படித்து புரிந்து கொள்ள வேண்டும். நீங்கள் ஆராய்ச்சியில் பங்கேற்பாளர்களாக ஒப்புதல் வழங்குவதற்கு முன்பு உங்களுக்கு ஏற்படும் அறிவியல் சார்ந்த சந்தேகங்கள் மற்றும் ஆராய்ச்சி சம்பந்தப்பட்ட சந்தேகங்கள் அனைத்தும் இந்த ஆராய்ச்சியின் எந்த காலகட்டத்திலும் நீங்கள் படிவத்தில் குறிப்பிட்ட நபரிடம் கேட்டு தெளிவுப்படுத்திக் கொள்ளலாம்.

1. ஆய்வின் தலைப்பு :

   கன்னியாகுமரி மாவட்டம் மக்களின் இயல்பான இன்டர் கேந்தல் மற்றும் ஔட்டர்கேந்தல் அளவை கண்டறிதல்.

2. தலைமை ஆய்வாளர் : டாக்டர். ஹரினி
   வழிகாட்டி : டாக்டர். தினக்ஷ் குமார் (எம்.டி.எஸ்)
   இணை வழிகாட்டி : டாக்டர். மேத்திவ் ஜோஷ் (எம்.டி.எஸ்).

3. நோக்கம் மற்றும் கொள்கைகள் :

   - கன்னியாகுமரி மக்களின் இயல்பான இண்டர் கேந்தல் மற்றும் ஔட்டர் கேந்தல் அளவை கணக்கிடுதல்
   - வயதின் அடிப்படையில் அவ்வளவுகளில் உள்ள வித்தாயாசம் கண்டறிதல்.
   - ஆண், பெண் இரு பாலர்களிக்கிடையே அவ்வளவுகளில் வித்தியாசத்தைக் கண்டறிதல்.

4. ஆய்வின் செயல்முறை :

   உங்களுக்கு தகவல் குறிப்பு எண் வழங்கப்படும்.தங்கள் இன்டர்கேந்தல் மற்றும் ஔட்டர் கேந்தல் அளவுகளை கண்டறிய இருக்கையில் அமரவேண்டும். தங்கள் தலை நேராக வைக்க அறிவுறுத்தப்படும்.பின்னர் வெர்ணியர் கேலிபர் கொண்டு இன்டர் மற்றும் ஔட்டர் கேந்தல் அளவுகள் அளக்கப்படும்.

5. ஆராய்ச்சியின் எதிர்பார்க்கப்படும் பங்குகால அளவு? ஒரு வருடம்

6. பங்கேற்பாளர்களுக்கு எதிர்பார்க்கப்படும் பயன்கள்?
   இந்த ஆய்வின் மூலம் நேரடியாக எந்த பயனும் கிடையாது.

7. ஆய்வில் கலந்து கொள்பவர்களுக்கு எதிர்பார்க்கப்படும் ஆபத்துக்கள் ? ஒன்றும் இல்லை.

8. இரகசியத்தன்மை காத்தல்?
   உங்களிடம் இருந்து சேகரித்த எந்த விபரமும் இரகசியமாக வைக்கப்படும். இதன்மூலம் கிடைக்கும் புள்ளிவிபரம் மட்டும் வெளியிடப்படும். மற்றபடி தனிநபரின் சொந்த விபரங்கள் வெளியிடப்படமாட்டாது.

9. இந்த ஆய்வின் மூலம் ஏதேனும் பின்விளைவுகள் ஏற்பட்டால் ஆராய்ச்சியாளர் பொறுப்பு ஏற்பாரா? ஆம்

10. இந்த ஆராய்ச்சியில் பங்குபெறுவோருக்கு எவ்வித தொகையும் வழங்கப்படுமா? இல்லை.

11. நான் இந்த ஆராய்ச்சியிலிருந்து விருப்பப்பட்டால் எந்த காலகட்டத்திலும் விலகலாமா?
   நோயாளியின் எந்த ஒரு கட்டுப்பாடு, நிபந்தனைகளின் கீழ் இந்த ஆய்விற்கு உட்படுத்தப்பட வில்லை. அவர்களின் முழு ஒத்துழைப்பு மற்றும் சம்மதத்தின் பேரில் மட்டுமே பங்கெடுத்துள்ளனர்.

12. ஏதேனும் புதிய செய்தி கண்டுபிடிப்பு பற்றி நான் அறிவிக்கப்படுவேனா? ஆம்.

13. வேறு ஏதேனும் பொருத்தமான விபரங்கள் உண்டா? இல்லை

14. இவ்வாராய்ச்சியைப் பற்றிய விவரங்களை யாரிடம் கேட்டு தெரிந்துக் கொள்வது?

டாக்டர். ஹரினி
முதுகலை மாணவி (எம்.டி.எஸ்)
முகம் மற்றும் தாடை சீரமைப்பு பிரிவு
ஸ்ரீ மூகாம்பிகா இன்ஸ்டிட்யூட் ஆப் டென்டல் சயன்ஸஸ்
குலசேகரம் - 629 161
தொலைபேசி எண்:7639658631
மின்னஞ்சல் :harident09@gmail.com

இடம் :
தேதி :

முதன்மை ஆராச்சியாளரின்
கையொப்பம்

பங்குபெறுபவரின் கையொப்பம் /
பாதுகாவலர் கையொப்பம்

CONSENT FORM (>18 years)

PART 1OF 2

PARTICIPANTS CONSENT FORM

The details of the study have been explained to me in writing and details have been fully explained to me. I am aware that the results of the study may not be directly beneficial to me but will help in the advancement of medical sciences. I confirm that I have understood the study and had the opportunity to ask questions. I understand that my participation in the study is voluntary and that I am free to withdraw at any time, without giving any reasons, without the medical care that normally be provided by the hospital being affected. I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose(s). I have given details of the study. I fully consent to participate in the study titled "Orbitofacial anthropometric analysis of inner-intercanthal and outer-intercanthal distance in Kanyakumari population-an invivo study".

Serial no/Reference no:

Name of the participant:

Address of the Participant:

Contact number of the Participant:

Signature/Thumb impression of the participant/Legal guardian

Witness

1.
2.

Date:

Place:

സമ്മതപത്രം (>18 വയസ്സ്)

ഭാഗം - 1

ഈ പഠനത്തെ പറ്റിയുള്ള എല്ലാ കാര്യങ്ങളും എനിക്ക് പറഞ്ഞ് മനസ്സിലാക്കി തരികയും അതിന്റെ ഒരു പകർപ്പ് എനിക്കു നൽകുകയും ചെയ്തിട്ടുണ്ട്. ഈ പഠനം ഗവേഷണത്തിനായി ഉള്ളതാണെന്നും എനിക്ക് ഇതിൽ നിന്ന് നേരിട്ട് ഒരു ഫലവും ഉണ്ടാകില്ലെന്നും ഞാൻ മനസ്സിലാക്കുന്നു. ഈ പഠനത്തിന്റെ രീതിയും ഉദ്ദേശവും എനിക്ക് മനസ്സിലാക്കി തന്നിട്ടുണ്ട്. അതു പോലെ എനിക്ക് സംശയങ്ങൾ ചോദിക്കാൻ അവസരങ്ങൾ ലഭിച്ചിട്ടുമുണ്ട്. ഇതിൽ പങ്കെടുക്കാനും പങ്കെടുക്കാതിരിക്കാനും ഉള്ള അവകാശം എനിക്കുണ്ടെന്നും അതുപോലെ പഠനത്തിന്റെ ഏതു ഘട്ടത്തിലും ഇതിൽ നിന്ന് പിൻവങ്ങാനുള്ള സ്വാതന്ത്ര്യവും എനിക്കുണ്ടെന്ന് ഞാൻ മനസ്സിലാക്കുന്നു. ഈ പഠനത്തിൽ പങ്കെടുക്കുന്നതു കൊണ്ടോ, പങ്കെടുക്കാത്തതുകൊണ്ടോ എന്റെ മറ്റു ചികിത്സകളെ ബാധിക്കുന്നതല്ലെന്ന് ഞാൻ അറിയുന്നു.

കന്യാകുമാരി ജനതയിൽ ഇന്റർ കാൻന്തലും ഔട്ടർ കാൻന്തലും തമ്മിലുള്ള ദൂരം ഓർബിറ്റോഷേഷ്യൽ ആൻസ്രഷോമെട്രി ഉപയോഗിച്ച്നിർണ്ണയിക്കൽ

പങ്കെടുക്കുന്ന ആളിന്റെ പേര് :
മേൽവിലാസം :

ഫോൺ നമ്പർ :

ഒപ്പ് / വിരലടയാളം

സാക്ഷി :

സ്ഥലം :
തീയതി :

ஒப்புதல் படிவம் (> 18 வயது)

பகுதி 2

பங்கேற்பாளரின் ஒப்புதல் படிவம்

இந்த ஆராய்ச்சியில் தகவல்கள் அனைத்தும் என்னிடம் தெளிவாக எழுத்து மூலம் விளக்கப்பட்டுள்ளது. இந்த ஆராய்ச்சியின் முடிவுகள் எனக்கு நேரடியாக பயன்பெறாவிட்டாலும் மருத்துவத்துறையின் முன்னேற்றத்திற்கு பயன்படும் என்பதை அறிவேன். **கன்னியாகுமரி மாவட்டம் மக்களின் இயல்பான இன்டர் கேந்தல் மற்றும் ஒளட்டர்கேந்தல் அளவை கண்டறிதல்** என்ற இவ்வாராய்ச்சியைப் பற்றி நான் தெளிவாக புரிந்து கொண்டுள்ளேன் மற்றும் இதைப்பற்றி என் சந்தேகங்களைத் தெளிவுபடுத்தியுள்ளேன். நான் நானாக முன் வந்து இதில் பங்குபெறுகிறேன் என்பதை அறிவேன். இதிலிருந்து எந்நேரமும் எக்காரணமுமின்றி என்னால் வெளிவர இயலும் என்பதை அறிவேன். அவ்வாறு நான் வெளிவந்தாலும் இந்த மருத்துவமனையில் எனக்கு கிடைக்கும் மருத்துவ உதவி எவ்விதத்திலும் பாதிக்கப்படாது என்பதையும் அறிவேன். இவ்வாராய்ச்சியின் மூலம் வரும் முடிவுகள் மற்றும் தகவல்களை அறிவியல் துறையின் பயன்பாடுகளுக்கு உபயோகப்படுத்திக் கொள்ள சம்மதிக்கிறேன். எனக்கு இவ்வாராய்ச்சியைப் பற்றி விரிவான தகவல் அடங்கிய படிவம் தரப்பட்டுள்ளது.

பங்கேற்பவரின் பெயர் :

பங்கேற்பவரின் முகவரி :

தொலைபேசி எண் :

பாதுகாவலர் அல்லது

பங்கேற்பவரின் கையொப்பம்

சாட்சி :

1.

2.

நாள் :

இடம் :

ASSENT FORM (7 - 18 years)

PART 2 OF 2

The details of the study have been explained to me in writing and details have been fully explained to me. I am aware that the results of the study may not be directly beneficial to me but will help in the advancement of medical sciences. I confirm that I have understood the study and had the opportunity to ask questions. I understand that my participation in the study is voluntary and that I am free to withdraw at any time, without giving any reasons, without the medical care that normally be provided by the hospital being affected. I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose(s). I have given details of the study. I fully consent to participate in the study titled. "Orbitofacial anthropometric analysis of inner-intercanthal and outer-intercanthal distance in Kanyakumari population - an invivo study".

Serial no/Reference no:

Name of the participant:

Name of the Father/Mother :

Address of the Participant:

Contact number of the Parent/Guardian:

Signature/Thumb impression of the Parent/Legal guardian :

Signature/Thumb impression of the participant :

Witness

1.
2.

Date:

Place:

സമ്മതപത്രം (7-18 വയസ്സ്)

ഭാഗം - 2

ഈ പഠനത്തെ പറ്റിയുള്ള എല്ലാ കാര്യങ്ങളും എനിക്ക് പറഞ്ഞ് മനസ്സിലാക്കി തരികയും അതിന്റെ ഒരു പകർപ്പ് എനിക്കു നൽകുകയും ചെയ്തിട്ടുണ്ട്. ഈ പഠനം ഗവേഷണത്തിനായി ഉള്ളതാണെന്നും എനിക്ക് ഇതിൽ നിന്ന് നേരിട്ട് ഒരു ഫലവും ഉണ്ടാകില്ലെന്നും ഞാൻ മനസ്സിലാക്കുന്നു. ഈ പഠനത്തിന്റെ രീതിയും ഉദ്ദേശവും എനിക്ക് മനസ്സിലാക്കി തന്നിട്ടുണ്ട്. അതു പോലെ എനിക്ക് സംശയങ്ങൾ ചോദിക്കാൻ അവസരങ്ങൾ ലഭിച്ചിട്ടുമുണ്ട്. ഇതിൽ പങ്കെടുക്കാനും പങ്കെടുക്കാതിരിക്കാനും ഉള്ള അവകാശം എനിക്കുണ്ടെന്നും അതുപോലെ പഠനത്തിന്റെ ഏതു ഘട്ടത്തിലും ഇതിൽ നിന്ന് പിൻവങ്ങാനുള്ള സ്വാതന്ത്ര്യവും എനിക്കുണ്ടെന്ന് ഞാൻ മനസ്സിലാക്കുന്നു. ഈ പഠനത്തിൽ പങ്കെടുക്കുന്നതു കൊണ്ടോ, പങ്കെടുക്കാത്തതുകൊണ്ടോ എന്റെ മറ്റു ചികിത്സകളെ ബാധിക്കുന്നതല്ലെന്ന് ഞാൻ അറിയുന്നു.

കന്യാകുമാരി ജനതയിൽ ഇന്റർ കാൻന്തലും ഔട്ടർ കാൻന്തലും തമ്മിലുള്ള ദൂരം ഓർബിറ്റോഷേഷ്യൽ ആൻസ്രഷോമെട്രി ഉപയോഗിച്ച്നിർണ്ണയിക്കൽ

പങ്കെടുക്കുന്ന ആളിന്റെ പേര് :

അച്ഛൻ / അമ്മയുടെ പേര്

മേൽവിലാസം :

ഫോൺ നമ്പർ :

പങ്കെടുക്കുന്ന കുട്ടിയുടെ പേര്

സാക്ഷി :

അച്ഛൻ / അമ്മയുടെ ഒപ്പ്

സ്ഥലം :

തീയതി

ஒப்புதல் படிவம் (7 - 18 வயது)
பகுதி 2
பங்கேற்பாளரின் ஒப்புதல் படிவம்

இந்த ஆராய்ச்சியில் தகவல்கள் அனைத்தும் என்னிடம் தெளிவாக எழுத்து மூலம் விளக்கப்பட்டுள்ளது. இந்த ஆராய்ச்சியின் முடிவுகள் எனக்கு நேரடியாக பயன்பெறாவிட்டாலும் மருத்துவத்துறையின் முன்னேற்றத்திற்கு பயன்படும் என்பதை அறிவேன். **கன்னியாகுமரி மாவட்டம் மக்களின் இயல்பான இன்டர் கேந்தல் மற்றும் ஒளட்டர்கேந்தல் அளவை கண்டறிதல்** இவ்வாராய்ச்சியைப் பற்றி நான் தெளிவாக புரிந்து கொண்டுள்ளேன் மற்றும் இதைப்பற்றி என் சந்தேகங்களைத் தெளிவுபடுத்தியுள்ளேன். நான் நானாக முன் வந்து இதில் பங்குபெறுகிறேன் என்பதை அறிவேன். இதிலிருந்து எந்நேரமும் எக்காரணமுமின்றி என்னால் வெளிவர இயலும் என்பதை அறிவேன். அவ்வாறு நான் வெளிவந்தாலும் இந்த மருத்துவமனையில் எனக்கு கிடைக்கும் மருத்துவ உதவி எவ்விதத்திலும் பாதிக்கப்படாது என்பதையும் அறிவேன். இவ்வாராய்ச்சியின் மூலம் வரும் முடிவுகள் மற்றும் தகவல்களை அறிவியல் துறையின் பயன்பாடுகளுக்கு உபயோகப்படுத்திக் கொள்ள சம்மதிக்கிறேன். எனக்கு இவ்வாராய்ச்சியைப் பற்றி விரிவான தகவல் அடங்கிய படிவம் தரப்பட்டுள்ளது.

பங்கேற்பவரின் பெயர் :

தந்தை/தாய் பெயர் :

பங்கேற்பவரின் முகவரி :

தொலைபேசி எண் :

தந்தை/தாய் அல்லதுபாதுகாவலர் கையொப்பம்

பங்கேற்பவரின் கையொப்பம் :

சாட்சி :

1.

2.

நாள் :

இடம் :

DATA SHEET

Sl. No	AGE in years	Sex (male or female)	Intercanthal distance (ICD) in mm	Outercanthal distance (OCD) In mm